Regency COMMUNICATIONS INC.

SERVICE MANUAL

UHF-FM BASE STATION

MODELS MCBU19A; MCBU19B
MCBU35A; MCBU35B

1227 S. PATRICK DRIVE
SATELLITE BEACH FLA

0300-4144-900

PRINTED IN U.S.A.
12-80

MCBU SERIES SERVICE MANUAL

SECTION 1 GENERAL INFORMATION

1-1 DESCRIPTION

The Microcom BU35 and BU19 are base station transceivers designed for use in the UHF (450-512 MHz) communications band. The MCBU35 has an RF power output of 35 watts and includes a 12-hour clock and VU Meter. The MCBU19 is similar to the MCBU35 but has a power output of 15W and the clock and VU Meter are excluded. Both models are capable of 1,2,3 or 4 channel operation (jumper selectable). The transceivers are all set to four-channel operation from the factory. As with the MCU34, the MCBU35/19 models are split into two frequency ranges (or bands). The MCBU35A/19A operate from 450-476 MHz while the MCBU35B/19B operate from 470-512 MHz.

The transmitter and receiver sections can be tuned independently allowing different transmit and receive frequencies. The maximum frequency spread for the receiver is ±.75 MHz (1.5 MHz difference between highest and lowest frequencies) and the maximum spread for the transmitter is ±3 MHz (6 MHz difference between highest and lowest frequencies). When both receiver and transmitter tune up within these limits, no performance degradation will be observed. However, if a wider transmitter bandspread is desired the broadband tuning procedure must be followed.

The receiver is a double-conversion, super-heterodyne type receiver. Silicon transistors and integrated circuits are used, which provide compactness and higher reliability under varying ambient conditions. A crystal first IF filter and ceramic second IF filter are used to provide for optimum performance where many closely-spaced channels are active.

The transmitter uses direct frequency modulation. An internal adjustment for deviation adjustment is factory set for ±5 KHz deviation in conformance with FCC Regulations. The power amplifier uses rugged RF power transistors for reliability and has a VSWR protection circuit to protect against damage that can occur if transmitting into an open or shorted antenna. Attenuation of spurious emissions, RF power output, frequency stability, performance under varying ambient temperatures and battery voltages, along with other specifications exceed the limits required by the FCC for transmitter type acceptance.

The 12-hour clock supplied with the MCBU35 can be wired for 24-hour operation. All MCBU35 clocks shipped from the factory are wired as 12-hour clocks.

1-2 SPECIFICATIONS

Transceiver Specifications

Transmitter Output Power Center-Tuned	304-114
Transmitter Output Power Broadband Tuned	304-115
Receiver Sensitivity Performance	304-116
Self-Quieting Spurious	304-122

1-3 EQUIPMENT SUPPLIED

a. 1 - Base Station Transceiver
b. 1 - Base Station Microphone
c. 1 - Owner's Instruction Manual

1-4 EQUIPMENT AVAILABLE (NOT SUPPLIED)

a.	MA-79, MA-126	Telephone Handset
b.	MA-85	Accessory Plug Kit
c.	MA-108	External Speaker
d.	MA-123	TTS Decoder
e.	MA-127	Standard Scanner
f.	MA-128	Open Channel Scanner
g.	MA-129	Priority Scanner
h.	MA-130	Timeout Timer
i.	MA-131	Horn Relay Driver
j.	MA-132	Central Metering
k.	MA-146	CTCSS Two-Call Decoder/Encoder
l.	MA-147	2805 Decoder
m.	MA-163	Audio P.A.
n.	MA-164	CTCSS w/Call Light Circuit Encoder/Decoder
o.	MA-166	CTCSS Encoder
p.	MA-305	R.F. Preselector
q.	MA-312	Tone Remote Desk Set
r.	MA-313	Tone Remote Adaptor Board
s.	MA-316	Desk Microphone (replacement use)
t.	MA-325	Mic Speech Compressor

1-5 EQUIPMENT NOT SUPPLIED

a. Antenna
b. Coaxial Cable Feedline
c. Coaxial Cable Connector

1-6 INSTALLATION

The MCBU35 and MCBU19 are shipped from the factory for use with 115V AC 60 Hz power sources (although available wired for 220VAC 50 Hz). Place the base station in a location where adequate ventilation is available, and not near heat sources such as radiators, etc.

Connect the desk microphone to the microphone connector, located under the speaker (on power supply chassis). Connect antenna via coaxial cable feedline.

NOTE: ANTENNA MUST BE PROPERLY ADJUSTED FOR THE 50 OHM OUTPUT OF THE TRANSCEIVER OTHERWISE A HIGH VSWR WILL REDUCE THE EFFECTIVE RADIATED POWER OR EVEN CAUSE THE VSWR PROTECTION CIRCUIT TO SHUT OFF THE TRANSMITTER ENTIRELY.

A three-pin connector to the left of the RF power amp's heatsink provides a connection for an external speaker. The remaining twelve-pin connector has no wiring installed and is provided for user's convenience to connect various special functions or accessories. Regency's MA-85 kit provides all necessary items for wiring this connector.

1-7 OPERATION

When power is first applied to the transceiver (MCBU35 only) the clock display will flash warning the user of an interruption of AC power. To set the clock: Turn on the radio and press the SPVR (supervisory) button and A (Option A) button simultaneously to set hours and press the SPVR button and B (Option B) button simultaneously to set minutes.

With the radio on, the volume should be adjusted to a comfortable listening level (Sq. control fully clockwise). When carriers are not present, adjust the squelch control until the receiver squelches (no noise from the speaker). Note that with the receiver squelched all the VU Meter LED's are out (MCBU35 only). Also, whenever a carrier is not present, the busy lamp is out indicating that the channel is not active.

To select a channel simply press the CH (channel) button to step through to the desired channel. The four buttons to the left of the channel button are (from L to R): INT (intercom), SPVR (supervisory), A (Option A), and B (Option B). All four of these buttons set and reset latches, i.e. push once to set the function and again to reset the function. The INT and SPVR functions only are active when the Remote Adapter Board (MA-313) is installed in the base station. The INT function will also disable the transmitter from operating when the function is set (LED is lit).

To transmit, push the transmit bar on the desk microphone. The transmit LED will light and when the operator speaks into the microphone the VU Meter will give a visual indication of the transmitter's modulation deviation (MCBU35 only).

If a decoder option is installed, the monitor bar on the microphone is used to open the squelch to allow the user to monitor transmissions on that frequency. Releasing the bar activates the decoder again and the receiver is squelched.

1-8 CRYSTAL SPECIFICATIONS

Miniature plug-in crystals are used in both the receiver and transmitter.

When ordering crystals specify:

1. The crystal part number
   302-539 Transmit crystal
   302-540 Receive crystal
2. The exact channel frequency required.

Crystal specifications are shown on the following pages.

304-112 | 1 | C

No	GENERAL	NOMINAL	GUAR
1	CHANNELS	1/4	
2	FREQ RANGE	450-512 MHZ 2 BANDS	
3	OPERATING TEMP	-30°C TO+60°C	
4	OPERATING DUTY CYCLE	EIA INTERMIT 1/4 MIN O/15 MIN & HR 3 CYCLE	
5	SIZE (W-D-H)	6-1/2" X 11-5/8" X 2-5/8"	16.5 X 29.5 X 6.7 CM
6	WEIGHT (INSTALLATION)	4-3/4 LB	2.15 KG
7	POWER	13.6V DC	
	CURRENT DRAIN	@ 13.6V DC	
8	RCVR SQUELCH	180 MA *	
9	RCVR MAX. AUDIO	800 MA *	
10	TRANSMIT	10A/5A* (*ADD 600 MA BELOW 0°C)	
11	ANTENNA	50 Ω	
12	CHANNEL SPACING	25KHZ	

No	RECEIVER	NOMINAL	GUAR
	SENSITIVITY		
13	20 DB Q	.4UV	.5UV (MAX)
14	12 DB SINAD	.3UV	.35UV (MAX)
	AUDIO SQ SENSITIVITY		
15	THRESHOLD	.20UV	.25UV (MAX)
16	TIGHT	.55UV	.7UV (MAX)
17	CTCSS		.20UV (MAX)
18	ADJ CH SEL 20DB	120db	100db (MIN)
19	ADJ. CH. DESEN 12DB	83db	80db (MIN)
20	OPERATING BANDWIDTH	±750KHZ FROM CTR	SEE 304-116
21	SPURIOUS & IMAGE	85db	80db (MIN)
22	IM 20 DB Q		75db (MIN)
23	IM 12 DB SINAD		75db (MIN)
24	MAB	±6.5KHZ	±7.5KHZ (MAX)
25	FREQ STAB TEMP.		±.0005% (MAX)
26	FREQ STAB VOLTAGE		±.0001% (MAX)
27	AUDIO RESPONSE		EIA 2-8.6db/OCT DE-EMPHASIS
28	AUDIO OUT PWR (MAX)		4W @ 5% DISTORTION

NO	RECEIVER	NOMINAL	GUAR
29	AUDIO OUT PWR (MAX)		5W @ 10% DISTORTION
30	SQ BLOCKING		3KHZ DEV, 300-3KHZ NONE EIA
31	RCVR ATTACK TIME		150ms (MAX)
32	RCVR SQ CLOSING		250ms (MAX)
33	HUM & NOISE RATIO		45db/60db (UNSQ/SQ)
34	UNDESIRED CONDUCTED (AC)		
35	UNDESIRED CONDUCTED (RF)		
36	UNDESIRED RADIATED		FCC
37	HIGH HUMIDITY		
38	VIBRATION STAB		
39	SHOCK STAB		
	TRANSMITTER	**NOMINAL**	**GUAR**
40	PWR OUTPUT	40W/20W	35W/15W (MIN)
41	DC PWR IN TO FINAL		70W/30W
42	OUT FREQ STAB (TEMP)		±.0005% (MAX)

NO	TRANSMITTER	NOMINAL	GUAR
43	OUT FREQ STAB (VOLT)		.0001% (MAX)
44	SPUR & HARM CONDUCTED		-60db/56db (MAX)
45	SPUR & HARM RADIATED		-60db/56db (MAX)
46	OPERATING BANDWIDTH	±3.0MHZ FROM CTR	SEE 304-114/304-115
47	EMISSION		16 F 3
48	MODULATION		±5KHZ (MAX)
49	AUDIO FREQ DISTORTION		3% (MAX)
50	FM HUM & NOISE		-60db (MAX)
51	AM HUM & NOISE		34db (MAX)
52	AUDIO FREQ RESPONSE		EIA 1/3 6db OCT PREEMPHASIS
53	TRANS CARRIER ATTACK		EIA: 100ms (MAX)
54	SIDEBAND SPECTRUM		EIA: -55db
55	HIGH HUMIDITY		
56	VIBRATION STABILITY		
57	SHOCK STABILITY		

REVISIONS

ZONE	REV	DESCRIPTION	BY	DATE	APPROVED
	C	REDRAWN AB 405	LLV	12/3/80	DOJ

MCU18H	MCU34H
MCU18	MCU31H
MCU15H	MCU34
MCU15	MCU31
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES ARE:
FRACT. ± DEC. .XX± .XXX± ANGLE ±

MATERIAL

FINISH

DO NOT SCALE DWG.

APPROVALS	DATE
DRAWN L.L.V.	12/3/80
CHECKED C.M.C.	12-8-80
DFTG. SUPV.	
ENGR. DOJ	12-6-80

304-112

Regency COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

SPECIFICATIONS

MICRO-COM U 30/15 SERIES

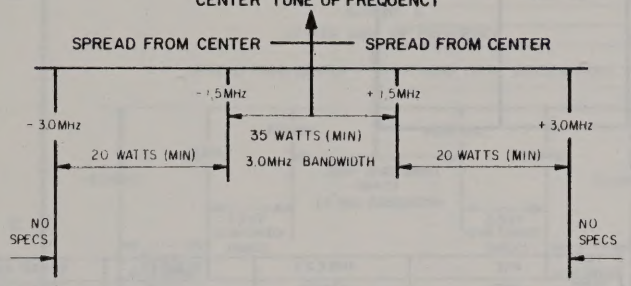
SIZE B | PART NUMBER 304-112 | REV. C

SCALE ____ | SHEET 1 OF 1

DWG NO. 304-114 | SH 1 | REV A

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
—	A	RELEASE R-016	9-7-78	DAJ

CHART 1
CENTER TUNE UP FREQUENCY



COMPUTATION TABLE (SEE NOTE 3)

(STEP 1) RECEIVE FREQ	(STEP 2) LARGEST/SMALLEST	(STEP 5) SPREAD FROM CTR	(STEP 6) WORST EXPECTED PWR OUT
F1 450.625 MHz	SMALLEST	- 2.0 MHz	20 W
F2 452.125		- 5 MHz	35 W
F3 452.625		CENTER	35 W
F4 454.125	LARGEST	+ 2.0 MHz	20 W

NOTES:

1. THE CENTERMOST FREQUENCY SHOULD BE SELECTED TO TUNE THE TRANSMITTER PER TP14-154.
2. TRANSMITTER POWER OUTPUT DEGRADATION MAY BE COMPUTED BY FOLLOWING THE STEPS LISTED BELOW AND THE COMPUTATION TABLE TO THE LEFT
3. STEP 1 - WRITE FREQUENCY DOWN
   STEP 2 - DETERMINE LARGEST AND SMALLEST VALUE
   STEP 3 - Δ = LARGEST - SMALLEST = BAND SPREAD
   Δ = 454.625 - 450.625
   Δ = 4.0 MHz
   STEP 4 - BEST CENTER FREQUENCY (BCF)
   BCF = SMALLEST + (Δ ÷ 2)
   BCF = 450.625 + 4.0MHz ÷ 2
   BCF = 450.625 + 2.0MHz
   BCF = 452.625
   IF BCF IS NOT F1, F2, F3 OR F4, CHOOSE CLOSEST VALUE & USE FOR BCF
   STEP 5 - COMPUTE SPREAD FROM CENTER OF EACH FREQUENCY
   F1-BCF = 450.625-452.625 = -2.0MHz
   F2-BCF = 452.125-452.625 = -0.5MHz
   F3-BCF = 452.625-452.625 = CENTER
   F4-BCF = 454.625-452.625 = +2.0 MHz
   STEP 6 - COMPUTE WORST EXPECTED POWER FROM CHART 1
   F1 — -2.0MHz (FALLS BETWEEN -1.5MHz & 3.0MHz) THEREFORE, READ DOWN THE COLUMN TO 20W
   F2 — SIMILAR TO F1
   F3 — SIMILAR TO F1
   F4 — SIMILAR TO F1

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE FRACT ± DEC XX± XXX± ANGLE ±	APPROVALS	DATE
			DRAWN mma.	9-5-78
			CHECKED CMC	9-6-78
			DFTG MG	9-7-78
		MATERIAL —	ENGR DAJ	9-7-78
	MCU 30	FINISH —		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DWG.	304-114	

Regency COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937

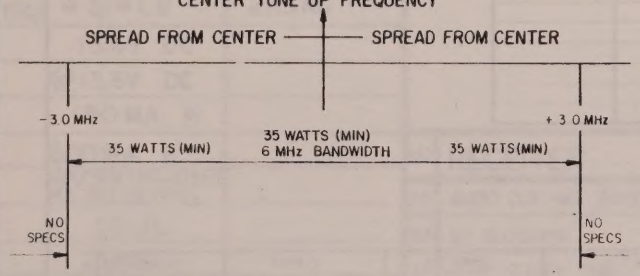
TRANSMITTER PWR OUTPUT PERFORMANCE DEGRADATION (CENTER TUNED)

SIZE B | PART NUMBER 304-114 | REV A | SCALE — | SHEET 1 OF 1

DWG NO 304-115 | SH 1 | REV A

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
—	A	RELEASE R-016	9-7-78	DAJ

CHART I
CENTER TUNE UP FREQUENCY



NOTES:

1 THE TRANSMITTER MUST BE TUNED BY TEST PROCEDURE 14-155 (DOUBLE TUNED) FOR THIS COMPUTATION METHOD TO BE USED

2 TRANSMITTER POWER OUTPUT DEGRADATION MAY BE COMPUTED BY FOLLOWING THE STEPS LISTED BELOW AND THE COMPUTATION TABLE TO THE LEFT

3 STEP 1- WRITE FREQUENCY DOWN
STEP 2- DETERMINE LARGEST AND SMALLEST VALUE.
STEP 3 - Δ = LARGEST — SMALLEST = BAND SPREAD
Δ = 455 125 — 450 125
Δ = 5.0 MHz
STEP 4 - BEST CENTER FREQUENCY (BCF)
BCF = SMALLEST + (Δ-2)
BCF = 450 125 + 5.0 MHz - 2
BCF = 450 125 + 2.5 MHz
BCF = 452.625
IF BCF IS NOT F1, F2, F3 OR F4, CHOOSE CLOSEST VALUE & USE FOR BCF
STEP 5 - COMPUTE SPREAD FROM CENTER OF EACH FREQUENCY
F1-BCF = 450 125 - 452 625 = -2.5 MHz
F2 BCF = 452 125 - 452 625 = -0.5 MHz
F3 BCF = 452 625 - 452 625 = CENTER
F4-BCF = 455 125 - 452 625 = +2.5 MHz
STEP 6 - COMPUTE WORST EXPECTED POWER FROM CHART I
F1 — -2.5 MHz, READ DOWN THE COLUMN TO 35W
F2 — SIMILAR TO F1
F3 — SIMILAR TO F1
F4 — SIMILAR TO F1

COMPUTATION TABLE (SEE NOTE 3)

(STEP 1) RECEIVE FREQ	(STEP 2) LARGEST/SMALLEST	(STEP 5) SPRD FRM CTR	(STEP 6) WORST EXPECTED PWR OUT
F1-150 125 MHz	SMALLEST	-2.5 MHz	35W
F2 152 125		- 5 MHz	35W
F3 152 625		CENTER	35W
F4-155 125	LARGEST	+2.5 MHz	35W

			APPROVALS	DATE
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE FRACT DEC ANGLE ± XX± ± XXX±	DRAWN [illegible]	9-5-78
			CHECKED CM-C	9-6-78
			QLTG SUPV [illegible]	9-7-78
		MATERIAL —	ENGR DAJ	9-7-78
	MCU 30	FINISH —		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DWG.	304-115	

Regency COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937

TRANSMITTER PWR OUTPUT PERFORMANCE DEGRADATION (DOUBLE TUNED)

SIZE B | PART NUMBER 304-115 | A

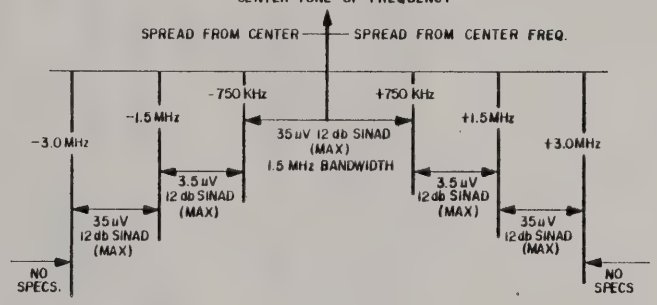
SCALE — | SHEET 1 OF 1

DWG NO. 304-116 SH 1 REV A

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	RELEASE R-016	9-7-78	RDJ

CHART 1

CENTER TUNE UP FREQUENCY



COMPUTATION TABLE (SEE NOTE 3)			
(STEP 1) RECEIVE FREQ	(STEP 2) LARGEST/SMALLEST	(STEP 5) SPREAD FROM CENTER	(STEP 6) WORST EXPECTED 12 db SINAD
F1-151.625 MHz	SMALLEST	-1.0 MHz	3.5 uV
F2-152.125 MHz		-.5 MHz	.35 uV
F3-152.625 MHz		CENTER	.35 uV
F4-153.625 MHz	LARGEST	+1.0 MHz	3.5 uV

NOTES:

1. THE CENTERMOST FREQUENCY SHOULD BE SELECTED TO TUNE THE RECEIVER.
2. RECEIVER SENSITIVITY DEGREDATION MAY BE COMPUTED BY FOLLOWING THE STEPS LISTED BELOW AND BY USING THE COMPUTATION TABLE TO THE LEFT.
3. STEP 1 - WRITE FREQUENCY DOWN
   STEP 2 - DETERMINE LARGEST AND SMALLEST VALUE
   STEP 3 - Δ = LARGEST - SMALLEST = BAND SPREAD
   Δ = 453.625 - 451.625
   Δ = 2.0 MHz
   STEP 4 - BEST CENTER FREQUENCY (BCF)
   BCF = SMALLEST + (Δ ÷ 2)
   BCF = 451.625 + 2.0 MHz ÷ 2
   BCF = 451.625 + 1.0 MHz
   BCF = 452.625
   IF BCF IS NOT F1, F2, F3 OR F4, CHOOSE CLOSEST VALUE & USE FOR BCF.
   STEP 5 - COMPUTE SPREAD FROM CENTER OF EACH FREQUENCY
   F1-BCF = 451.625 - 452.625 = -1.0 MHz
   F2-BCF = 452.125 - 452.625 = -0.5 MHz
   F3-BCF = 452.625 - 452.625 = CENTER
   F4-BCF = 453.625 - 452.625 = +1.0 MHz
   STEP 6 - COMPUTE WORST QUIETING FROM CHART 1
   F1 - -1.0 MHz (FALLS BETWEEN -750 KHz & -1.5 MHz) THEREFORE, READ DOWN THE COLUMN TO 3.5 uV
   F2 - SIMILAR TO F1
   F3 - SIMILAR TO F1
   F4 - SIMILAR TO F1

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT ± DEC .XX ± .XXX ± ANGLE ±	APPROVALS	DATE
			DRAWN	9-5-78
			CHECKED BMcC	9-6-78
			QA/TG SUPV	9-7-78
		MATERIAL —	ENGR RDJ	9-7-78
	MCU 30	FINISH —		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DWG.		

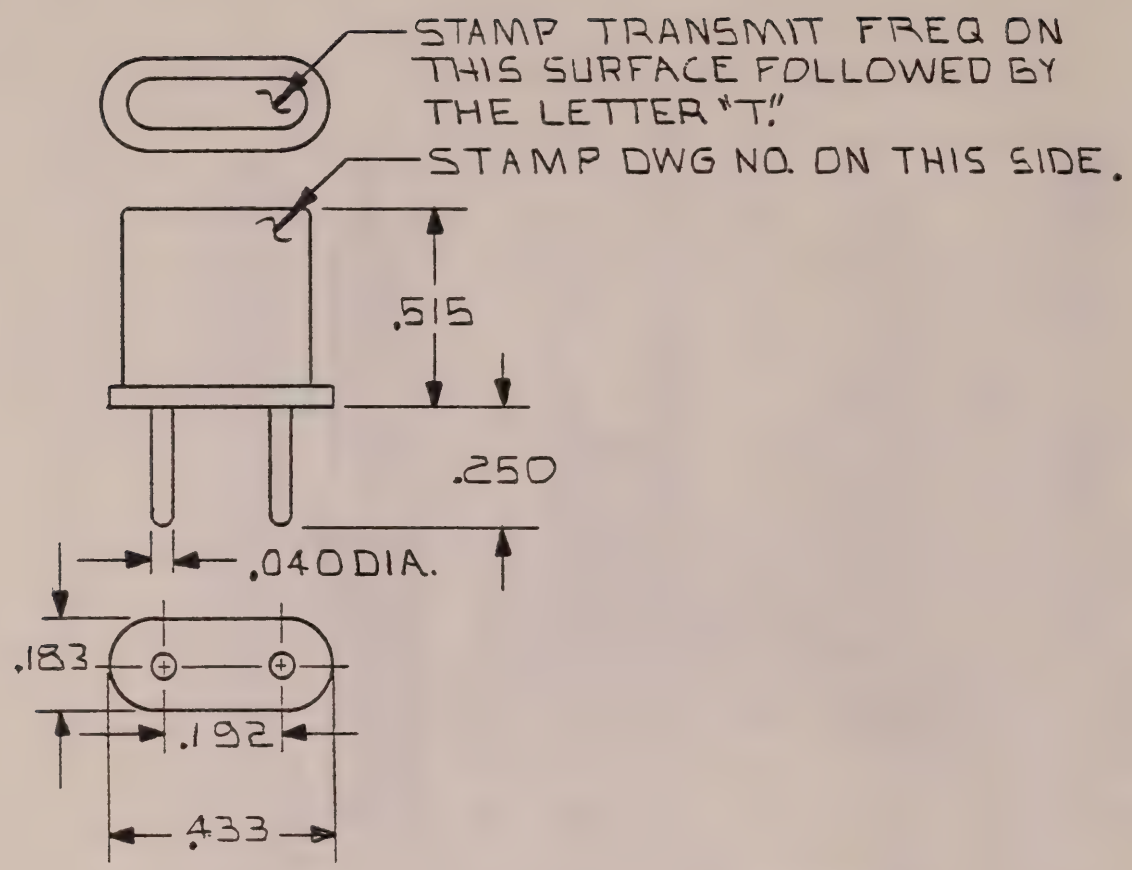
Regency COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937

SENSITIVITY PERFORMANCE DEGREDATION

SIZE B PART NUMBER 304-116 REV A

SCALE — SHEET 1 OF 1

BISHOP GRAPHICS/ACCUPRESS REORDER NO A 2506



CRYSTAL IS A FUNDAMENTAL MODE MOUNTED IN A HC-25/U HOLDER.

NORMAL TRANSMIT FREQ. RANGE: 450-512 MHz

CRYSTAL FREQ.: TRANSMIT FREQ. / 36

LOAD CAPACITY: 32PF

DRIVE LEVEL: 2.0MW

CRYSTAL SERIES RESISTANCE: 25 OHMS MAX.

FREQ. CALIBRATION: $\pm$.0015 @ 25°C

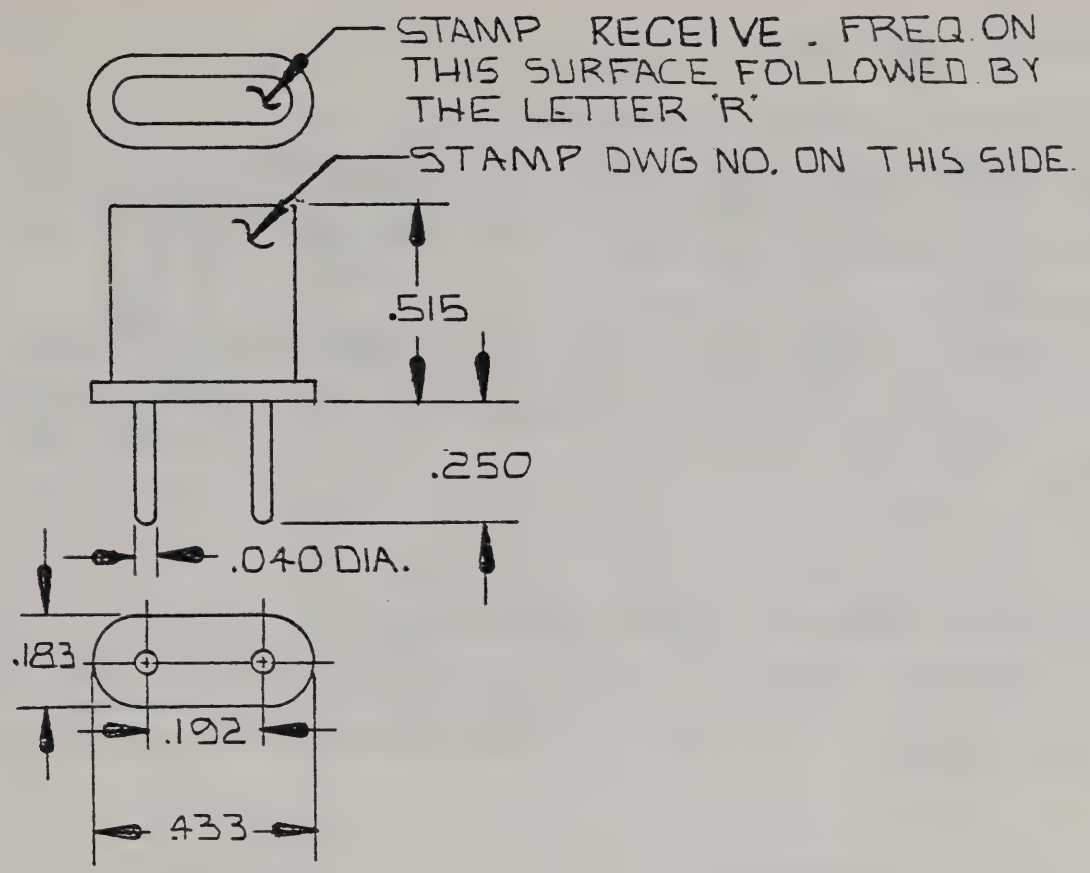
FREQ. TOLERANCE: $\pm$.0005% FROM 0°C TO +60°C

C_1 = .025PF $\pm$10%

C_o = 5.5PF $\pm$10%

CRYSTAL FREQ. RANGE: 12.5 MHz TO 14.23 MHz

TRANSMIT CRYSTAL



CRYSTAL IS A 3RD OVERTONE MODE MOUNTED IN A HC-25/U HOLDER.

NORMAL RECEIVE FREQ. RANGE: 450-512 MHz

CRYSTAL FREQ.: RECEIVER-10.7 MHz CRYSTAL FREQ. RANGE 48.8 to 55.7 MHz.
9

LOAD CAPACITY: 32PF

DRIVE LEVEL: 2.0MW

CRYSTAL SERIES RESISTANCE: 35 OHMS MAX.

FREQ. CALIBRATION $\pm$ .001% @ 25°C

FREQ. TOLERANCE: $\pm$.001% FROM 0°C TO +60°C

C_1 = .0017PF $\pm$20%

C_o = 5.5PF $\pm$10%

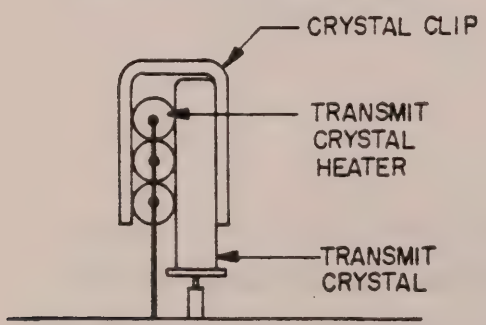
RECEIVE CRYSTAL

1-9 CRYSTAL INSTALLATION

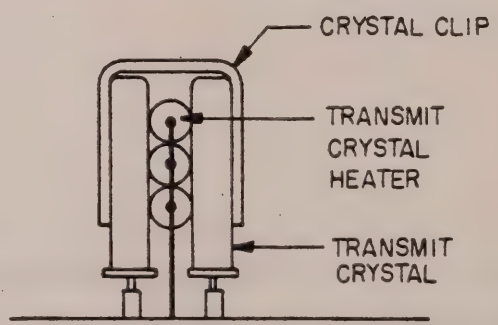
To install transmit or receive crystals the unit will have to be opened. Do this by removing two (2) sheet metal screws from the back of the radio (one in upper left corner; one in lower right corner). Push firmly on the power amplifier's heatsink and the chassis will slide out the front.

Special care must be used when installing the crystals. A crystal heater is used to maintain the transmit frequency within ±2.5ppm of its assigned frequency and the receiver frequency within the AFC range when ambient temperatures vary from -30°C to +60°C.

When installing the transmit crystal make sure the crystal body is in contact with the entire heating element. Where there are only two or less channels being used the heating element with the thermistor must be used (chan. positions 1 and 2). After the crystal is seated in the socket, press the crystal clip over the crystal/heater assembly. Use P/N 2830-1420-702, two crystal clip, when two crystals are used in conjunction with a single heater and P/N 2830-1420-701, single crystal clip, when only one crystal is used with a heater. The complete crystal/heater/clip assembly is illustrated below:

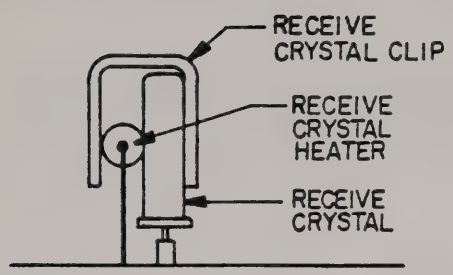


ONE CRYSTAL PER HEATER

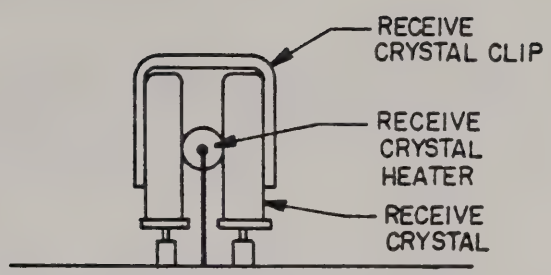


TWO CRYSTALS PER HEATER

When installing the receive crystal, again make sure the crystal makes contact with the heating element. After the crystal is seated in its socket, place the crystal clip over the crystal/heater assembly. Like the transmitter, the receiver crystal clips are P/N 2830-1420-702 for two-crystal clip and P/N 2830-1420-701 for single crystal clip. The complete assembly is illustrated on the following page.



ONE CRYSTAL PER HEATER



TWO CRYSTALS PER HEATER

Refer to receiver and transmitter alignment procedures in this manual for crystal netting.

SECTION 2 CIRCUIT DESCRIPTIONS

2-1 RECEIVER RF FRONT END, 1ST MIXER AND 10.7 IF

The RF amplifier stage, Q203, functions as a common gate, low noise RF amplifier and as a preselector. The amplifier is matched to a two-section helical filter on its input, L205 and L206 and on its output, L212 and L213. The signal then passes to the gate of the first mixer, Q206.

The first local oscillator (L.O.) injection frequency is at a frequency 10.7 MHz lower than the incoming signal frequency. It is obtained from a crystal oscillator-multiplier chain consisting of Q201, Q202 and Q205. The crystal oscillator, Q201, uses a third overtone crystal operating in the 48.8 to 55.7 MHz range and is followed by a buffer-amplifier stage, Q202. The signal is then tripled by the Q205 stage, filtered by the two-section helical filter, L215 and L216, and injected into the source of the J-FET mixer, Q206.

2-2 IF AUDIO CIRCUITS

The output (drain) of the first mixer is a 10.7 MHz IF signal. This signal is filtered by a six-pole bandpass crystal filter (XF201, XF202 and XF203) and is amplified by the Q207 stage before passing to the second mixer (internal to IC201). The second L.O. oscillator, also contained in IC201, operates at 10.245 MHz. At those receive frequencies with a self-quieting problem with 10.245 MHz, the second L.O. frequency is moved to 11.155 MHz. The crystal frequency is stamped on top of the crystal (Y202).

The 455 KHz signal from the second mixer (IC201 Pin 3) is filtered by a 455 KHz bandpass ceramic filter (CF201). The signal is then amplified, limited and detected with a quadrature detector. The adjustable quadrature coil, L220, is across Pins 4 and 8 of IC201.

The demodulated audio signal (Pin 10 IC201) passes to both the audio amplifier circuits and to the noise-operated squelch circuit. The squelch control, R423, adjusts the signal level input to the squelch circuit. The squelch amplifier has a peak response in the 5 KHz to 20 KHz frequency range so it is the noise in this range that activates the squelch. The squelch amplifier output is rectified by CR204 and CR207 to a DC voltage at the input of the squelch switch. When the squelch is closed, this voltage is approximately 0.7 VDC, the squelch switch output is 0 VDC and the audio is squelched with Q204 off. With open squelch or with sufficient carrier present, this voltage is less than 0.7V, the switch output is 8V, Q204 is biased active and the audio passes on to the audio amplifier IC202.

The demodulated audio (Pin 10 IC201) passes through the de-emphasis network (R238 and C245), Q204, the volume control, and on to the audio amp (IC202). The audio amp is capable of delivering 5 watts to the speaker.

2-3 MAIN BOARD, TRANSMITTER

The audio circuit consists of a pre-emphasis network, limiter and post limiter filter. The input from the high impedance, ceramic microphone is both pre-emphasized and amplified by the operational amplifier circuit of IC301A. The limiter, transistors Q307 and Q308, limits the output voltage and prevents over-deviation of the transmitter. The operational amplifier circuit of IC301B is a low pass filter and amplifier. The signal amplitude is adjusted by R328, the deviation control, before passing to the modulator.

The crystal oscillator circuit, Q301, operates at 1/36 the channel frequency, 12.5 to 14.3 MHz. The oscillator frequency is frequency modulated by a varactor diode, CR301A or CR301B, etc. depending on the channel selected.

The collector output of the oscillator is tuned to the third harmonic of the crystal frequency and is amplified by the buffer, Q302. The signal is then frequency multiplied by a tripler circuit, Q303, a doubler circuit, Q304, and another doubler circuit, Q305, to reach the 450-512 MHz range. The power output of the main board is 500mw minimum and is sufficient to drive the power amplifier.

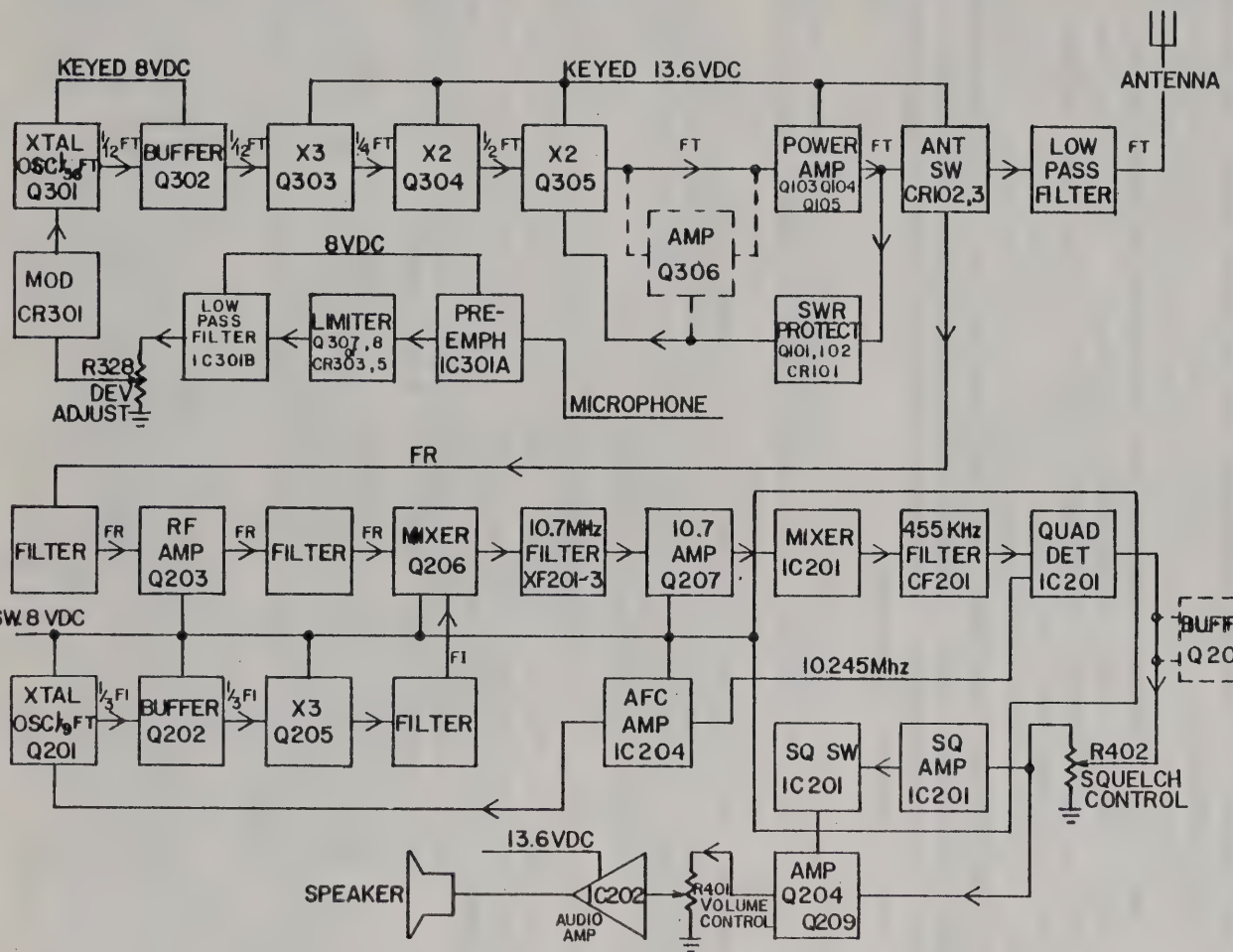
The power amplifier chain in the MCBU19 transceiver series consists of Q103 and Q104 and is capable of 15W of output power. The final device, Q104, is VSWR protected.

The power amplifier chain in the MCBU35 transceiver consists of Q103, Q104 and Q105 and is capable of 35W of output power. The final device, Q105, is VSWR protected.

The VSWR protection circuit senses the reflected power at the antenna port due to any antenna mismatch. The sensed reflected power is converted to a DC control voltage which is fed back to the output transistor in the exciter, Q305. Any reduction in the control voltage results in less drive to the power amplifier and thus less RF output power. A directional coupler, formed by CR101, R107 and the plating run between them, senses the reflected power. The signal, rectified by CR101, is amplified to the control voltage by Q101 and Q102.

A transmit-receive switch consisting of PIN diodes CR103 and CR102, the plating run between them, and their bias circuitry switches the antenna between the receiver input and the transmitter output. The-push-to-talk (PTT) switch in the microphone, when depressed, grounds the relay coil, RY301, which switches the 13.6 VDC and 8 VDC from the receive mode to the transmit mode.

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	R-393 DCD 9-80	9-10-80	Daj



TRANSMITTER & RECEIVER BLOCK DIAGRAM MICROCOM U30 SERIES

			APPROVALS	DATE
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT. ± DEC. .XX± .XXX± ANGLE ±	DRAWN DCD	9/80
			CHECKED	
			DFTG. SUPV.	
		MATERIAL	ENGR. DAJ	9/80
NEXT ASSY	USED ON	MICROCOM U30 FINISH		
APPLICATION		DO NOT SCALE DWG.		

Regency COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937

BLOCK DIAGRAM

SIZE C | PART NUMBER 504-434 | REV A

SCALE 2-1 | SHEET 1 OF 1

2-5 CONTROL BOARD DESCRIPTION

The MCBU Control Board is a two-sided PC board mounted by five screws to the front panel assembly. The electrical connections are made via a 5" length of 34 conductor ribbon-cable.

Located on this board are the: ON/OFF/Volume Control, the Squelch Control, the Busy Light Threshold Control (screwdriver adj.) and five push button switches, SW401 through SW405. SW401 is the channel stepping switch which allows sequential channel stepping for up to four channels and is associated with the channel display, CR401, a seven-segment LED display. SW402 controls the "A" option, with associated LED indicator. SW403 controls the "B" option, with associated LED indicator. SW404 controls the intercom feature, with associated LED indicator. SW405 controls the supervisory function, with associated LED indicator.

There is a red LED, CR424, indicating a transmit condition whenever A+ is supplied to the transmitter circuit. Next to the transmit LED there is an amber, busy LED, CR417. This is turned on whenever a carrier is present.

The control board has female pins located so as to accomodate a "VU" Meter Board (MA-309) and a Clock Board (MA-308) for the MCBU35 only. The two male pins, "A7" and "G", are for connecting the wires from the internal speaker.

When the MCBU is first plugged in and turned on, all counters and flip-flops are reset by C405, R418 and CR438 so that all options come up in the "OFF" condition and channel #1 is automatically selected. However, due to the routing of the unswitched +13 VDC line, the transceiver will always retain the same channel and option configuration that was previously selected each time the unit is tuned off and on (barring loss of AC power).

The channel selection is accomplished by a push-button switch, SW401, applying a low to Pin 8 of Nand Gate 404C, forcing Pin 10 high. This is fed to the clock input, Pin 14, of the ripple counter, IC403, which causes it to advance one state (only one output being high at a time). The counter's four outputs are fed to two drivers, IC401 and IC402. IC401 feeds four transistor drivers, Q401 through Q405, which operate a diode matrix to light the channel indicator, CR401. IC401 also sends four signals to the main board to operate diode switches for selecting receiver crystals. The second of these driver chips, IC402, sends its outputs ot the main board for selection of the transmitter crystals.

The Option "A" is selected by switch, SW402. This puts a low on Pin 5 of Nand Gate 404B, causing a positive transition at Pin 4 (this gate can be disabled by $\overline{\text{RIU}}$, $\overline{\text{Remote In Use}}$, signal being low, or if the ON/OFF switch is off). This positive transistion is fed to Pin 3 of flip-flop 405A, which makes the Q side, Pin 1, go high, turning on Q405, which causes S-12 to go low, picking up a relay on

the interconnect board and also lighting the "A" option LED. The "B" Option works the same way only utilizing gate 404A, flip-flop 405B, Q406 and causing S-13 to go low to pick up its associated relay on the interconnect board.

The SPVR (supervisory) function is selected by depressing SW404, which takes a low from the collector of turned-on transistor Q407, and applies it to Pin 1 of inverter 407A, causing Pin 2 to send a positive transition to Pin 3 of flip-flop 406A, the Q output at Pin 1 goes high, turning on Q410 which lights the "SPVR" LED. This level at Pin 1, (D25), is also sent to the remote adapter board. The "INT" (intercom) selection circuit functions in much the same way, utilizing inverter 407F, flip-flop 406B and driver Q409. The Q output of flip-flop 406B is also the D26 signal out to the remote adapter board. At the same time the $\overline{Q}$ side of flip-flop 406B, Pin 12, going low, holds off Q408 which makes it impossible to put a low on the C5 line and energize the transmit relay. Both the SPVR and INT functions only apply to a base station which uses a MA-313 remote adapter board.

When the press-to-talk switch is depressed, the C7 signal at Pin 3 of inverter IC407B, goes low forcing Pin 4 high. This disables the Busy Light through CR422 and turns on Q408 keying the transmitter. The transmitter may be disabled by being in the intercom mode or by the $\overline{RIU}$ signal (D25) from the remote adapter board being low. Keyed 13.6V (P2) is used to light the transmit LED.

2-6 POWER SUPPLY DESCRIPTION

The Power Supply is a +13.8 VDC unit with a continuous duty rating of 12 amps. The voltage is adjustable from approximately 12V to 15V by R2107 which has screwdriver access through bottom of unit. Exterior chassis mounted components consist of: microphone connector (front panel), fuseholder and AC line cord (right side), pass transistors Q1 and Q2 (heatsink).

By re-wiring the primaries of transformer T1, the supply may be adapted to 240 VAC as well as 120 VAC, 50-60 cycles (note - for 240 VAC wiring a 1.5A fuse must be used).

The secondary of T1 feeds a full wave rectifier bridge, CR1, which has noise suppression caps (C1 through C4) strapped across all four legs. The unregulated voltage from the bridge is connected to the regulator board at point 3 and also to the collectors of the pass transistors (mounted on the heatsink). The pass transistors are controlled by the current supplied to their bases from the driver transistors Q2101 and Q2102. These driver transistors are controlled by the driver output, Pin 2 of IC2101. The reference for IC2101 is derived from the regulated output (via JU2101) by a voltage divider network R2106 through R2109. Under normal operation the voltage at Pin 6 is 1.75 VDC.

R2105 is paralleled by thermistor RT2101 for temperature stability. External sensing capability is facilitated by removing JU2101 and substituting an external sense to regulator board.

There is also space available in the power supply chassis for the addition of the Speech Amp PC Board (MA-100) and the Tone Remote Adapter Board (MA-313) as shown in the power supply chassis layout (Figure - 1).

2-7 MA-308 12-HOUR CLOCK (MCBU35 ONLY)

The MA-308 clock utilizes the MM5402 12/24 hour clock IC. This chip directly drives four LED displays (CR701-CR704) from Pins 1 through 22, 37, 39 and 40. User selected jumpers are used to select a 12-hour or 24-hour display format.

To convert from 12-hour to 24-hour clock, remove R703 and JU705, and install JU701 through JU704 and JU706. JU706 tells IC701 that 24-hour format is being selected.

The clock for IC701 is derived from IC702, an oscillator/ divider IC. The timing element is a 3.579545 MHz crystal. C701 and C702 are selected for the proper frequency which is measured on Pin 7 of IC702. The frequency measured at Pin 7 should be 3.5796 MHz ±150 Hz.

Each of the displays (CR701 - CR704) is supplied with voltage from a display regulator circuit which eliminates the needs for excessively large dropping resistors.

WARNING: THE HEATSINK FOR Q703 GETS VERY HOT: AVOID CONTACT WITH IT.

The display regulator works by supplying more current as needed by the display (when more segments light up). When more current is demanded by the display the voltage drop across R706 increases. This drop in voltage causes less current to flow through the B-E junction of Q704, which, in turn, allows more current to flow through the B-E junction of Q703 and thereby increasing the current supplied to the display. Because of the limited gain in the circuit it will not perform as a perfect regulator and, therefore, some voltage variation with loading will occur.

For the time-setting functions, the inputs (Pins 34 and 33) of IC701 are controlled by Q701 and Q702, respectively. Pin 34 is the fast-set and Pin 33 is the slow-set. Q701 turns on when the A line (A Option button pressed) and the ENA line (SPVR button pressed) go high, activating the fast-set. Q702 turns on when the B line (B Option button pressed) and the ENA line (SPVR button pressed) go high, activating the slow-set.

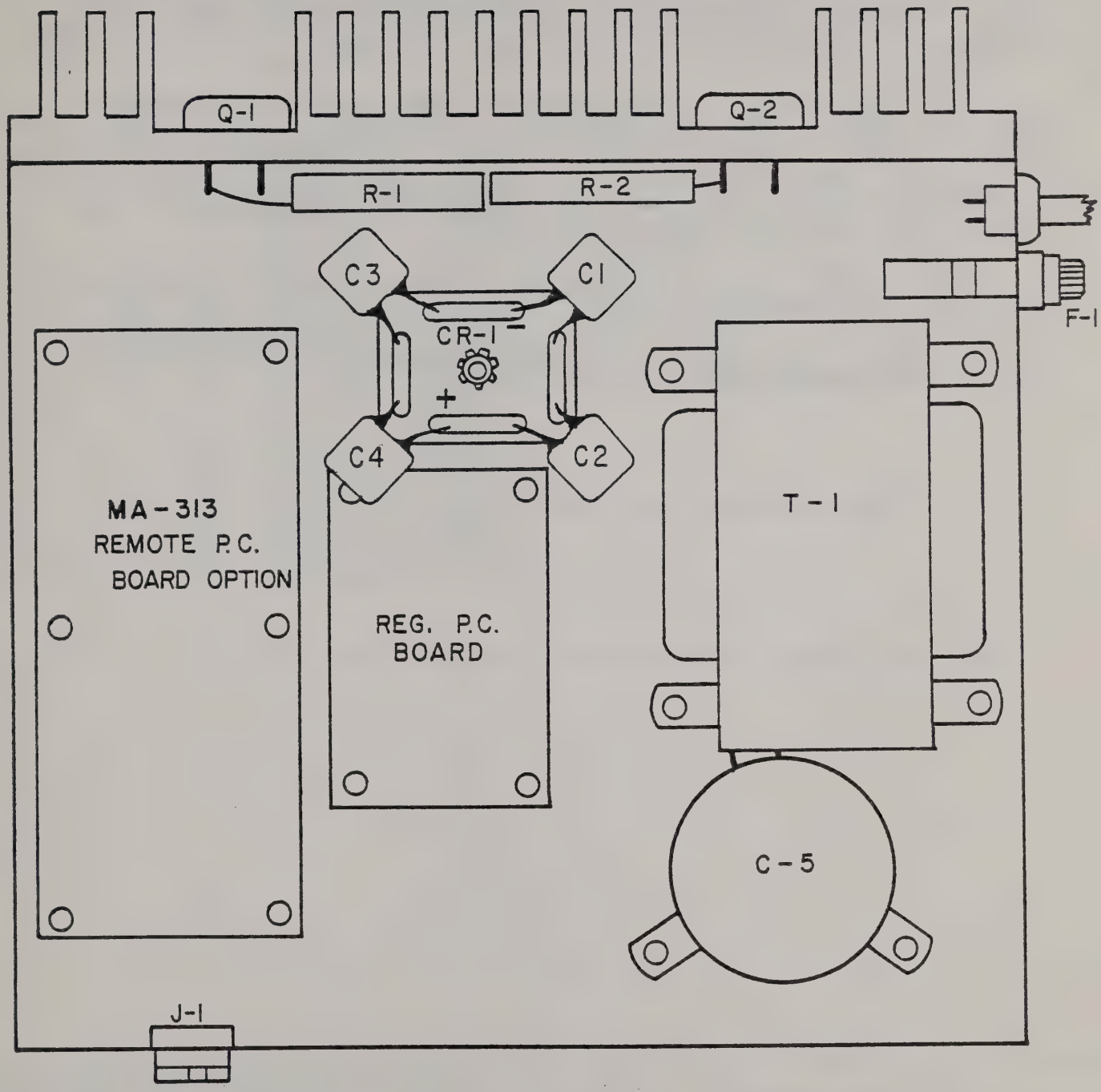


FIGURE 1

POWER SUPPLY CHASSIS LAYOUT

2-8 MA-309 VU METER (MCBU35 ONLY)

The VU Meter circuit has two audio inputs, A4, receiver audio from the volume control and A10, the modulator speech amplifier output. When the transceiver is in the receive mode Q801 is biased on from an external pull-up coming from the $\overline{PTT}$ input.

The audio from A4 is amplified by Q801 and is fed to IC801 where the analog level is converted to drive the correct number of LED's. On Rev. C meter boards, or later, there is another transistor, Q802, that is turned on by the external pull-up connected to $\overline{PTT}$ and grounds the A10 input to stop any feedback path this would create from the speech amplifier.

When the $\overline{PTT}$ line is pulled low (transmit mode) the receive audio amp is biased off and Q802 releases the A10 line (on Rev. C or later boards), which allows the audio from the speech amp to feed to IC801. The LED's light up to reflect the amount of modulation being transmitted.

APPLICATION	
NEXT ASSY	USED ON
	MCBU-35
	MCB4-19

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	R-250	1-31-80	HDT
B	EN-AB177	6-16-80	HDT

REV B | SH 1 | DWG. NO. TP14-273

FINAL TEST PROCEDURE - MICRO COM BU35 SERIES

I. Test Set-Up

A. Equipment

1. MICRO COM Base Transceiver
2. HP 410 DC VTVM
3. DC Power Supply with Ampmeter. 13.8 VDC 15 Amps.
4. VOM Simpson 360 (Digital)
5. AC VTVM
6. Audio Oscillator
7. Mic matching network
8. 450 MHz Thruline Wattmeter, 40 dB Power Pad and 50W Element
9. Spectrum Analyzer
10. Deviation Meter*
11. Frequency Counter*
12. Small Blade Tuning Tool and Hex Tuning Tool
13. Tune-Up Crystal
14. Band Reject Filter
15. PTT Switch

*Can be replaced with Cushman or similar equipment

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE FRACT. ± DEC .XX± .XXX± ANG. ±	APPROVALS	DATE
	DRAWN	11/30/80
	CHECKED	
	QFTG. SUPV.	
MATERIAL	ENGR. HDT	11/30/80
FINISH		
DO NOT SCALE DRWG.		

Regency® COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

TEST PROCEDURE - MICRO COM BU35
MICRO COM BU19

SIZE	PART NUMBER	REV.
A	TP14-273	B

SCALE	SHEET 1 OF 9

Test Interconnection Diagram

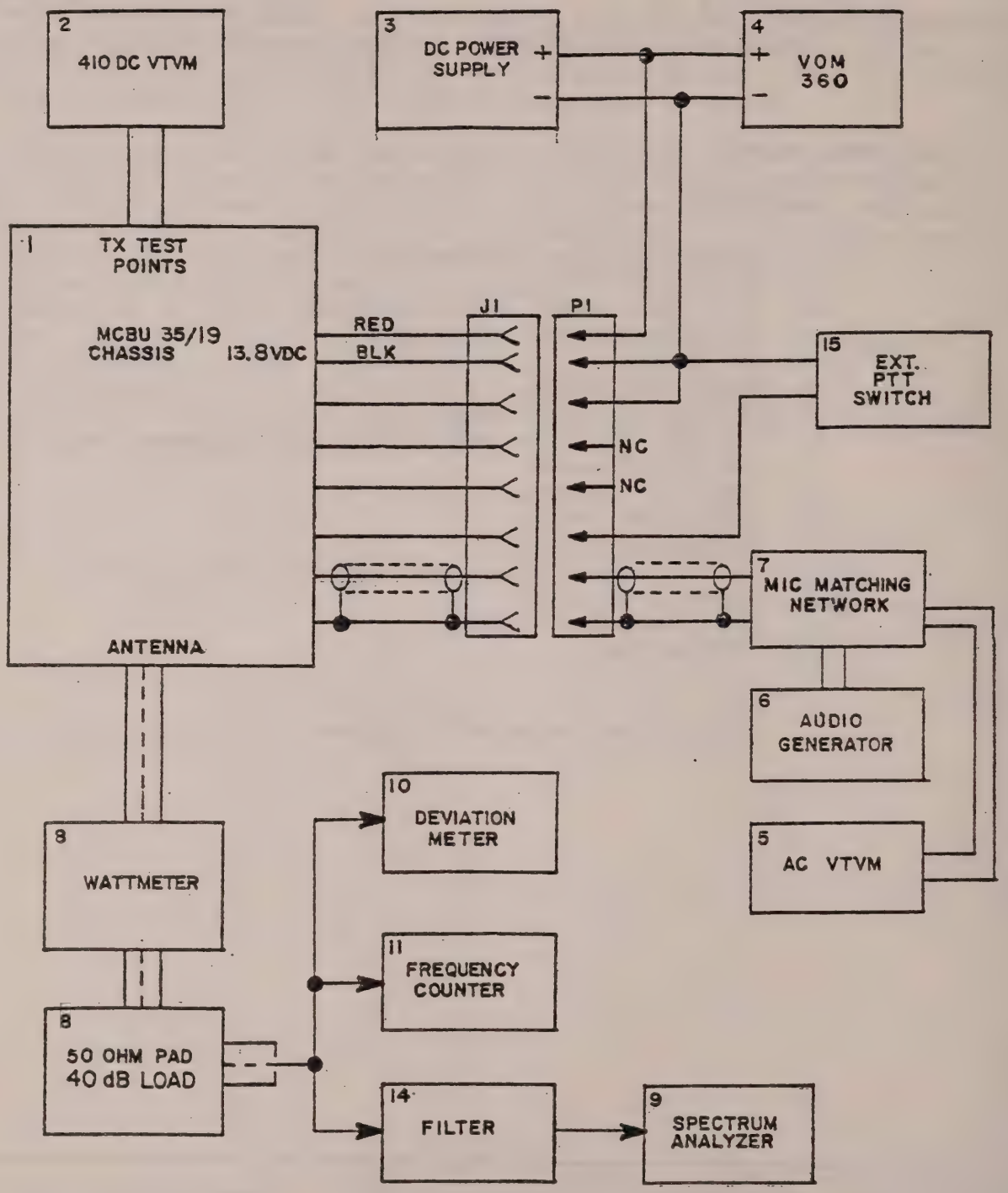


FIGURE 1 - TRANSMITTER TEST SET-UP

DRAWN SJR	DATE 1-11-80	SIZE A	PART NUMBER TP14-273	REV. B
APPROVED	DATE 1-30-80			
DO NOT SCALE DWG.		SCALE		SHEET 2

II. Set-Up Instructions

A. Insert tune-up crystal in F1 position. The tune-up crystal is selected as follows:

Freq Range	450-476 MHz	476-512 MHz
Frequency	462 MHz	492 MHz

B. Insert external power connector and set power supply(3) to 13.8 VDC as indicated on VOM(4).

C. Connect wattmeter, 40 dB attenuator(8), band reject filter(14) and spectrum analyzer(9) to antenna connector.

D. Plug P1 into J1.

E. Set channel selector to CH1.

F. Turn on the radio with the ON/OFF volume switch.

III. Tune-Up Procedure

A. VTVM Metering - Set VTVM(2) on 1.5V scale. TP M1 voltage reading is referenced to chassis ground. All others are referenced to keyed 13.8V. Key transmitter with external PTT and key only when measuring or tuning.

1. Monitor M1. Tune L304 and L305 for minimum positive voltage. Voltage should be 0.1V to 0.45V. A reading 0.5V indicates oscillator, Q301, is not oscillating.
2. Monitor M2. Tune L306 and L307 for maximum negative voltage. To find the dip, set coil forms even and tune by alternating one turn on each coil. No dip indicates no drive to Q303.
3. Monitor M3. Tune L310, L311 and L312 for max. neg. voltage. No dip indicates no drive to Q304.
4. Monitor M4. Tune L316 for maximum negative voltage. No dip indicates no drive to Q305.

B. Tune C358 on the main board and C112, C131, C132, C121 and C133 on the power amplifier for maximum power out as measured on the wattmeter(8). Power should exceed 35W. Current delivered to the transceiver from the power supply(3) should be less than 13A.

C. If channel spacing exceeds 1.5 MHz refer to the broad band tuning procedure, TP14-272.

D. Connect counter(11) to the output of the 40 dB attenuator(8) and set the F1 warp control, L301A, to the nominal crystal frequency ±100 Hz.

E. Conducted spurious emissions measurement. Tune band reject filter(14) so that the carrier is not notched and set the

spectrum analyzer(9) carrier indication to the 0 dB reference line. Tune the band reject filter to attenuate the carrier at least 30 dB. All harmonics should be 59 dB or more lower than the reference.

F. Deviation adjustment.

1. Connect audio generator(6) to microphone input. Set the generator for 1 KHz at 1 VAC. Connect the deviation meter(10) to the attenuator(8) output.
2. Key the transmitter and adjust R328 for ±5 KHz deviation as measured on the meter.

G. Check the modulation sensitivity by reducing the audio generator output until the deviation is ±3 KHz. The measured generator output on the AC VTVM(5) should be less than 20mv rms.

H. Reconnect the counter(11) to attenuator(8). Insert the crystal in each channel. All channels must be capable of being warped on frequency ±100 Hz. Repeat G and monitor deviation meter(10) on each channel. Deviation should be ±4.5 Khz,(±500 Hz tol.)

I. Crystal heater circuit check. When RT301 is cooled or when DC power is initially applied to the transceiver the collector of Q306 should drop to a maximum voltage of 2 VDC as measured on VTVM(2). After 1 minute this voltage should stabilize around 6 to 8 VDC.

IV. Table of Performance Limits

PARAMETER	MIN	TYP	MAX	UNITS
M1 without xtl - M1 with xtl	.1	.3	.45	ΔVDC
M2 without Xtl - M2 with xtl	1.0	1.7	2.5	ΔVDC
M3 without xtl - M3 with xtl	2.0	3.0	3.25	ΔVDC
M4 without xtl - M4 with xtl	.5	1.1	1.6	ΔVDC
Deviation	-	-	±5.0	KHz
Mic Mod Sens	-	10	20	mVrms
Collector Q306 cold	-	1.5	2.0	VDC
Tx Power Output	35	40	50	W
DC Current	9	11	13	A

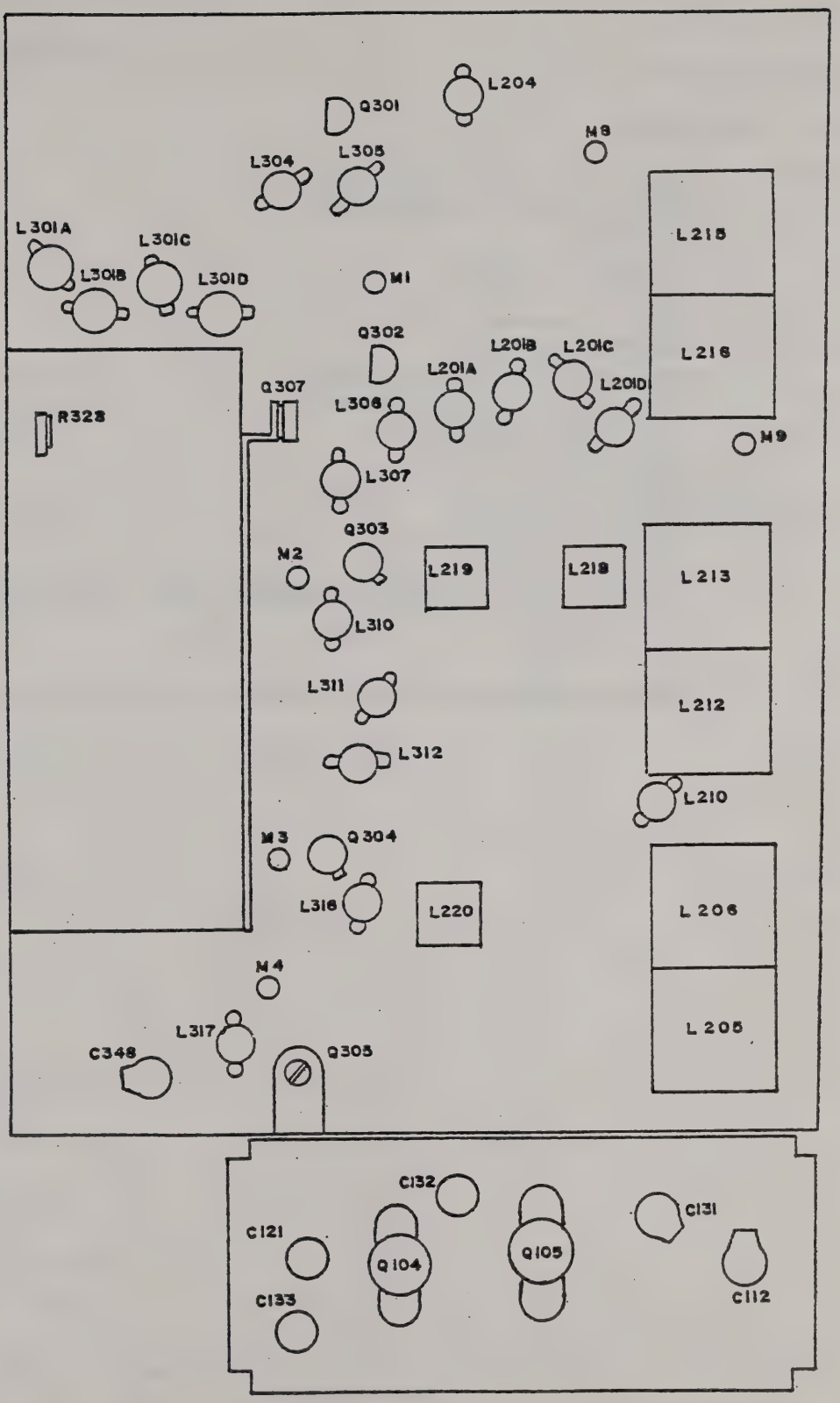


FIGURE 2 - TRANSMITTER, RECEIVER AND POWER AMPLIFIER TUNING POINTS

DRAWN SJR	DATE 1-10-80	SIZE A	PART NUMBER TP14-273	REV. B
APPROVED	DATE 1-30-80			
DO NOT SCALE DWG.		SCALE		SHEET 5

RECEIVER ALIGNMENT

I. Test Set-Up

A. Equipment

1. MICRO-COM BU35 Transceiver
2. UHF-FM Signal Generator*
3. AC VTVM
4. DC Power Supply
5. DC VTVM or VOM
6. VOM - Simpson 360(Digital)
7. Hex Tuning Tool
8. Small Blade Screwdriver
9. Small Blade Tuning Tool
10. 10.7 MHz Oscillator
11. Frequency Counter*
12. Sub-Audible Tone Generator
13. Tune-Up Crystal
14. Audio Oscilloscope
15. 3.2 ohm Speaker Load
16. Sinadder or Distortion Meter with 1000 Hz Band Elimination Filter

*Can be replaced with Cushman or similar equipment

DRAWN	DATE	SIZE	PART NUMBER	REV.
APPROVED JDT	DATE 1-30-80	A	TP14-273	B
DO NOT SCALE DWG.		SCALE		SHEET 6

B. Test Interconnection Diagram

Receiver Alignment

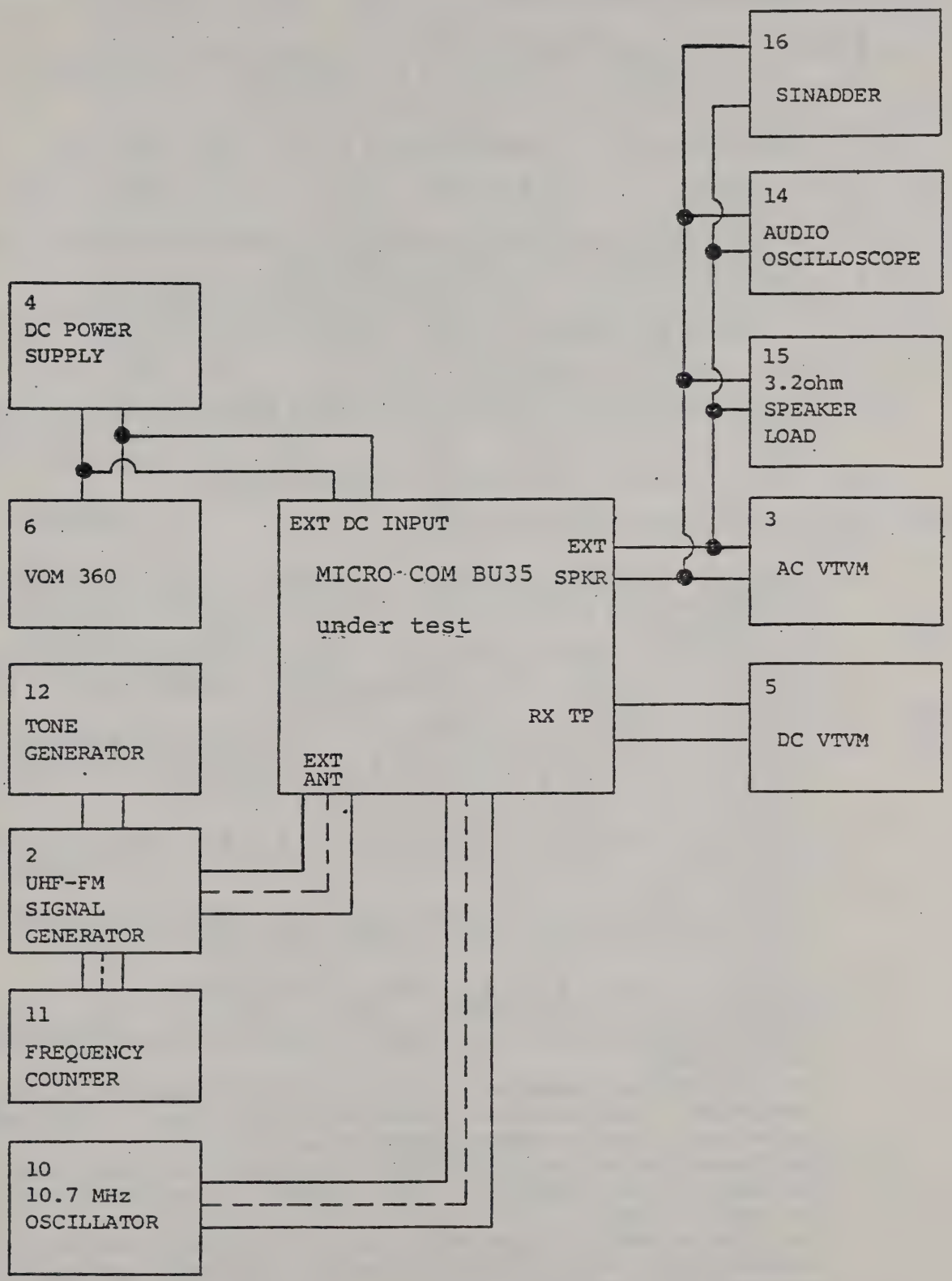


FIGURE 4

DRAWN	DATE	SIZE	PART NUMBER	REV.
APPROVED HDT	DATE 1/30/80	A	TP14-273	B
DO NOT SCALE DWG		SCALE –		SHEET 7

II. Test Set-Up Instructions

A. Set DC voltage to 13.8 VDC as measured on VOM(6).
B. Insert tune-up crystal in F1 position. The crystal is selected as follows:

Freq Range	450-476 MHz	476-512 MHz
Frequency	462 MHz	492 MHz

C. Set UHF-FM signal generator(2) to tune-up crystal frequency as measured on frequency counter(9).
D. 1. Set squelch control (R402) fully clockwise.
1. On tone units, set tone monitor switch to monitor position or unground microphone hangup button.
E. Set channel selector to CH1.
F. Preset L210 as follows: above 465 MHz, screw the slug all the way into the coil; below 465 MHz screw the slug out to the top of the coil.
G. Turn on radio with ON/OFF volume switch.

III. Receiver Alignment Procedure

A. Connect AC VTVM(3) across the speaker load and adjust the ON/OFF volume control for a readable VTVM(3) reading on the 1 VAC scale.
B. Monitor K11 with DC VTVM(5). Inject strong 10.700 MHz signal into the vicinity of L319 and Q207. Set K11 to 3.5 VDC by adjusting L220.
C. Monitor M8 with the DC VTVM(5). Adjust L204 for minimum voltage at M8. A voltage dip of 0.05V from the oscillator off to the oscillator on should be observed. A reading of 0.6 VDC indicates no drive to Q205.
D. Modulate signal generator(2) with a 2 KHz tone at +3 KHz deviation. Increase generator output for 6 dB SINAD on Sinadder(16).
E. Adjust L205, L206, L212 and L213 for best 12 dB SINAD by constantly reducing the signal generator(2) output for 12 dB SINAD.
F. Adjust L215 and L216 for best 12 dB SINAD.
G. Monitor K11 with DC VTVM. Adjust L201A to 3.5V.
H. Increase deviation to ±6 KHz. Adjust L218 and L219 for best 12 dB SINAD.
I. Set the signal generator(2) for a 1 KHz tone at +3 KHz deviation. Adjust the generator output for 12 DB SINAD. The generator should read no more than .35 uv.
J. Increase the signal generator(2) output to 100 uv and turn the volume control, R403, to full volume. The AC VTVM(3) should exceed 4.0 VAC.
K. Set the signal generator(2) to -130 dBm and remove the modulation. Set AC VTVM(3) to the 1V scale and use the volume control to set voltage to 1.0 VAC. This is 20 dB quieting and the generator should read less than 0.5uv.

DRAWN	DATE	SIZE	PART NUMBER	REV.
APPROVED	DATE 1-30-80	A	TP14-273	B
DO NOT SCALE DWG.		SCALE		SHEET 8

L. Set the signal generator(2) output to -130 dBm. Set the squelch control, R402, to threshold, just quieting the receiver noise. Increase the signal generator output until noise appears. This is threshold squelch and the generator should read less than .25uv.

M. Turn the squelch control fully counterclockwise. Increase the signal generator output until the squelch opens. This is tight squelch and the generator should read less than 0.7uv.

N. Monitor K11 with DC VTVM(5) set on 10V scale. Set signal generator(2) for 100uv and offset the frequency +3.0 KHz from the crystal frequency. Voltage at K11 should increase from 3.5 VDC on frequency to at least 4.5 VDC with +3.0 KHz offset.

O. The tuning should be done on a center frequency. It may be necessary to adjust L205, L206, L212, L213, L215 and L216 for best sensitivity on the highest frequency and the lowest frequency. If frequency spacing exceeds 1.5 MHz refer to 304-116 for sensitivity degradation. To net F2, F3 and F4 repeat steps G and I adjusting L201B, L201C and L201D.

IV. Table of Performance Limits

PARAMETER	MIN	TYP	MAX	UNITS
M8	-	.5	.55	VDC
12 dB SINAD	-	.3	.35	uv
20 dBQ	-	.4	.5	uv
Threshold Squelch	-	.2	.25	uv
Tight Squelch	-	.55	.7	uv
Audio Output 1 KHz Tone 3 KHz Dev	4.0	4.2	-	VAC
Noise Output	4.0	4.2	-	VAC
K11 +3 KHz offset	4.5	6.0	-	VDC

APPLICATION	
NEXT ASSY	USED ON

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	R-221	2-1-80	Daf

REVA | SH1 | DWG. NO. TP-14-272

TEST PROCEDURE: MCU-30 TRANSMITTER TUNING (DOUBLE TUNED)

The broadband tuning procedure is required only if the difference between the highest frequency and the lowest frequency exceeds 1.5 MHz. After the transmitter has been center tuned per TP-14-154 the following steps are performed to broadband the transmitter. The equipment set-up is identical to that of Fig. 1,TP-14-154. All metering voltages are referenced to 13.6 VDC.

1. Monitor M2 with VTVM(2) on -10 VDC scale.
2. Set the frequency selector to the channel with the lowest frequency. Note voltage reading on VTVM.
3. Set the frequency selector to the channel with the highest frequency. Note VTVM reading.
4. Tune L305 and L307 such that the voltage reading at M2 is the same at both the highest frequency and the lowest frequency.
5. Monitor M3. Repeat steps 2 and 3. Tune L310, L311 and L312 for maximum negative voltage at both the highest frequency and the lowest frequency. Voltage should be at least -3.0 VDC.
6. Monitor M4. Repeat steps 2 and 3. Tune L316 for maximum negative voltage at both the highest frequency and the lowest frequency. Voltage should be about -1.0 VDC.
7. Monitor RF output on wattmeter. Repeat steps 2 and 3. Tune L317 and C348 for maximum power out at both the highest frequency and the lowest frequency.
8. For transmitter power output performance degradation refer to 304-115.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE

FRACT. ± DEC .XX± .XXX± ANG. ±

MATERIAL

FINISH

DO NOT SCALE DRWG.

APPROVALS	DATE
DRAWN	2-1-80
CHECKED	
DFTG. SUPV.	
ENGR. Daf	2-1-80

Regency® COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

TEST PROCEDURE: MCU-30 TRANSMITTER TUNING (DOUBLE TUNED)
APPLIES TO MAIN BD. 704-064 ONLY

SIZE	PART NUMBER	REV.
A	TP-14-272	A

SCALE

SHEET 1 OF 1

APPLICATION	
NEXT ASSY	USED ON
	MCB SERIES

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	R-344	6-28-80	H Tetrault

REV A | SH 1 | DWG. NO. TP-14-304

TEST PROCEDURE

MCB CONTROL BOARD

(704-091)

I. TESTING OF MCB Control Board (704-091)

A. Equipment Needed

1. Test Fixture - TF-14-304 (See Fig. 3)
2. Control Board
3. D.C. Power Supply
4. Audio Generator (5 KHz)
5. Small bladed adjustment tool

B. Set-Up Instruction

1. Turn on power supply. (Do not connect to test fixture yet.)
   a. Adjust voltage to +13.8 VDC.
2. Connect oscillator to test fixture as per Fig. 1.
   a. Adjust oscillator for 2.50 VAC (r.m.s.) @ 5 KHz.
3. Set test fixture controls as follows:
   a. "Audio" SW. - OFF
   b. "R.I.U." SW. - OFF
   c. $\overline{\text{CH. ENA}}$ SW. - ON
4. Plug control board into test fixture.
   a. Turn ON/OFF switch OFF, on control board (See Fig. 2).

C. Test Procedure

1. Connect power supply to test fixture as per Fig. 1.
   a. Current meter should read 70MA ±10MA.
   b. CH. #1 lights should be lit on test fixture.
   c. All lights should be out on control board.
2. Turn ON/OFF volume switch on control board to: ON.
   a. All L.E.D. indicators on control board should be OFF, except for "Busy" light.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE	APPROVALS	DATE
FRACT. ± DEC .xx± .xxx± ANG. ±	DRAWN GM	6/19/80
	CHECKED	
	QFTG. SUPV.	
MATERIAL	ENGR. HDT	6/20/80
FINISH		
DO NOT SCALE DRWG.		

Regency® COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

TEST PROCEDURE -- MCB Control Board (704-091)

SIZE	PART NUMBER	REV.
A	TP-14-304	A

SCALE - SHEET 1 OF 5

b. CH. #1 should be indicated on control board.

3. Using button on control board, cycle channel indicator.
   a. Read-out on control board should sequence from 1 through 4 and back to 1 again, etc.
   b. Channel indicators on test fixture should also follow sequence.

4. Turn $\overline{\text{CH. ENA}}$ Switch OFF.
   a. Channel displays on both control board and test fixture should go out (indicating no channel selected).
   b. Return $\overline{\text{CH. ENA}}$ Switch to ON position.

5. Using push buttons on control board, select option INT, SUPP., A, B.
   a. All four of these lights are now lit.
   b. Cycle each switch a few times to insure proper operation. Leave all four function lights lit.
   c. Meter on test fixture should now read: 260MA $\pm$20MA.

6. Position test fixture R.I.U. Switch to ON.
   a. It is now impossible to change channels.
   b. A & B option switches also are disabled.
   c. Using control board button, turn off "INT" light.
   d. Insure that "PTT" button on test fixture is inoperative.

7. Return R.I.U. Switch to OFF.
   a. Insure that "PTT" button can now cause transmitter light to light.
   b. Busy light will also go out.

8. Turn test fixture "Audio" Switch to ON.
   a. "Busy" light can now be adjusted ON or OFF, by POT on lower right of control board, using tuning tool.
   b. Threshold of ON/OFF condition of "Busy" light should occur at approximately mid-range of POT.

9. Turn off Power Switch on control board; remove control board.

REV. A
SH. 3
DWG. NO. TP-14-304

TEST FIXTURE

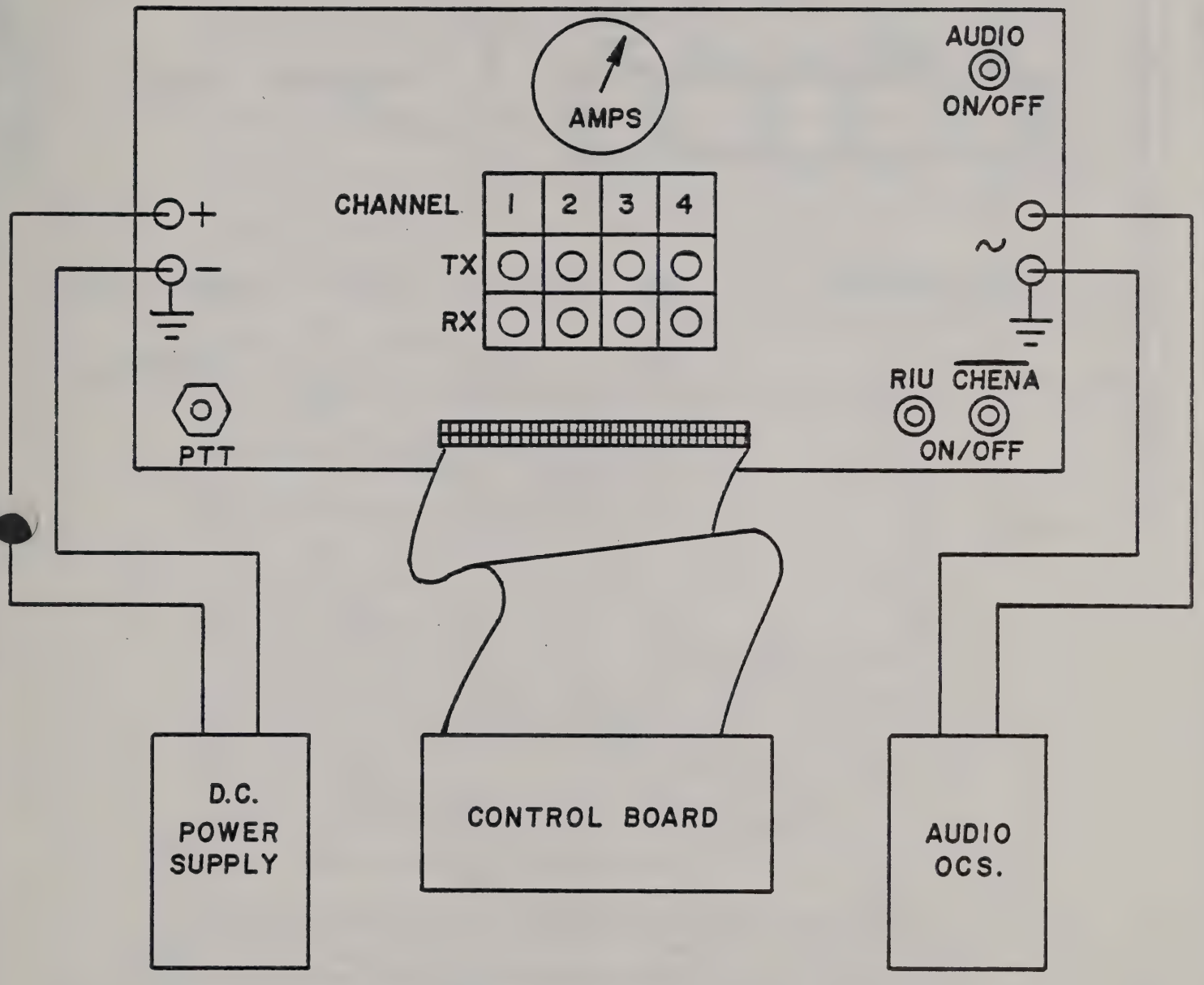


FIGURE - 1

DRAWN SDH	DATE 6/19/84	SIZE A	PART NUMBER TP-14-304	REV. A
APPROVED	DATE 4/28/85			
DO NOT SCALE DWG.		SCALE		SHEET 3

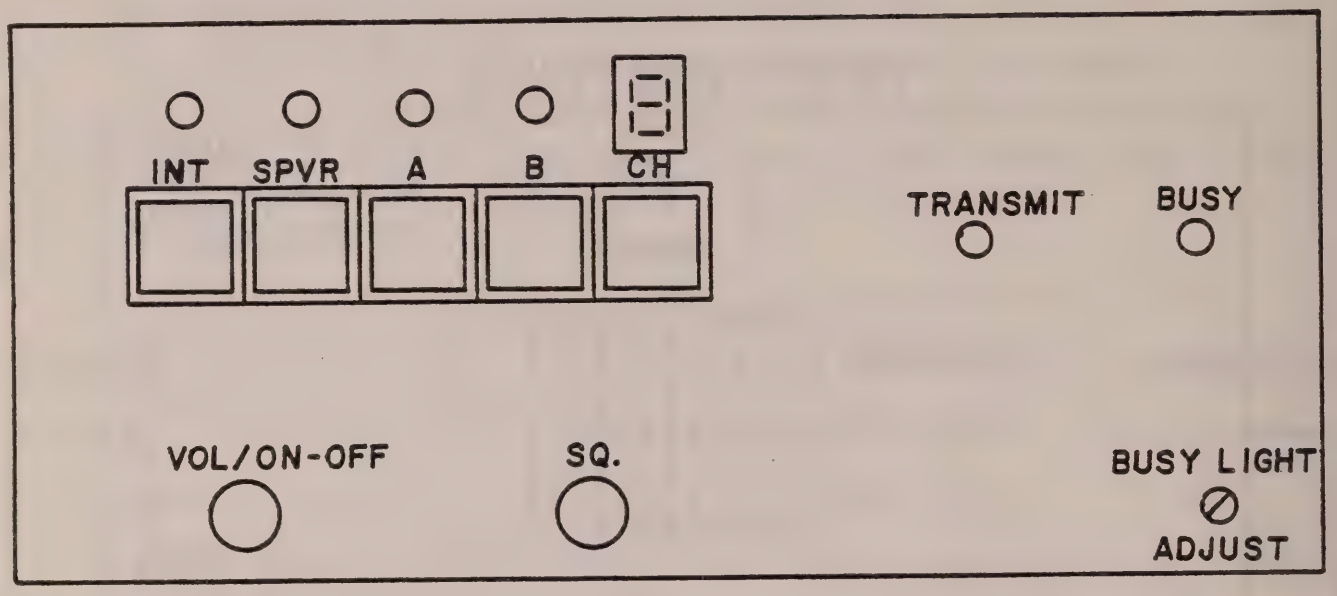


FIGURE-2

DRAWN SDH.	DATE	SIZE	PART NUMBER	REV.
APPROVED H.D.	DATE 6.28.80	A	TP-14-304	A
DO NOT SCALE DWG.		SCALE		SHEET 4

REVISIONS				
ZONE	REV	DESCRIPTION	TE	APPROVED
	A	R-344 SDN.	19-80	HDT

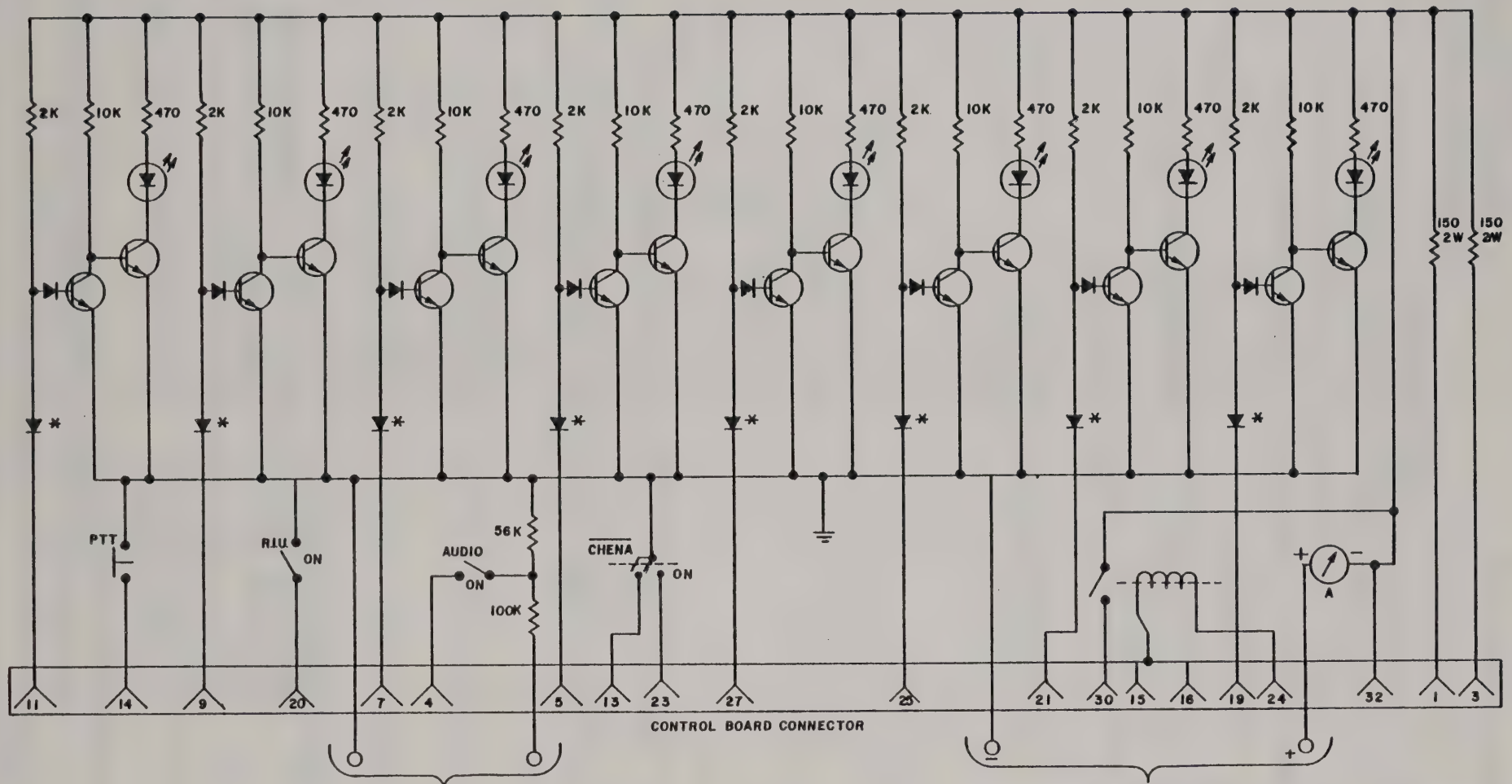
ALL RX L.E.D. ARE GREEN

ALL TX L.E.D. ARE RED

A = 500MA AMMETER

ALL TRANSISTORS ARE - 952-2

* DIODES ARE GERMANIUM # 4807-1233-900
OTHER DIODES ARE IN4148



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT. DEC. ANGLE ± .XX± ± .XXX±	APPROVALS	DATE
			DRAWN SDN	6-80
			CHECKED LCM	6-80
			QA/TE SUPV.	
		MATERIAL	ENGR HDT	6-80
	MCB	FINISH		
NEXT ASSY	USED ON	DO NOT SCALE DWG.		
APPLICATION				

Regency COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

SCHEMATIC TEST PROC.
TP14-304

SIZE	PART NUMBER	REV.
C	504-398	A

SCALE | SHEET 5 OF 5

DWG. NO. 504-398 SH 1 REV A

APPLICATION	
NEXT ASSY	USED ON

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	R-316	6-2-80	HDT
B	EN-AB177	6-16-80	H. Tichard

REV B | SH 1 | DWG. NO. TP-14-297

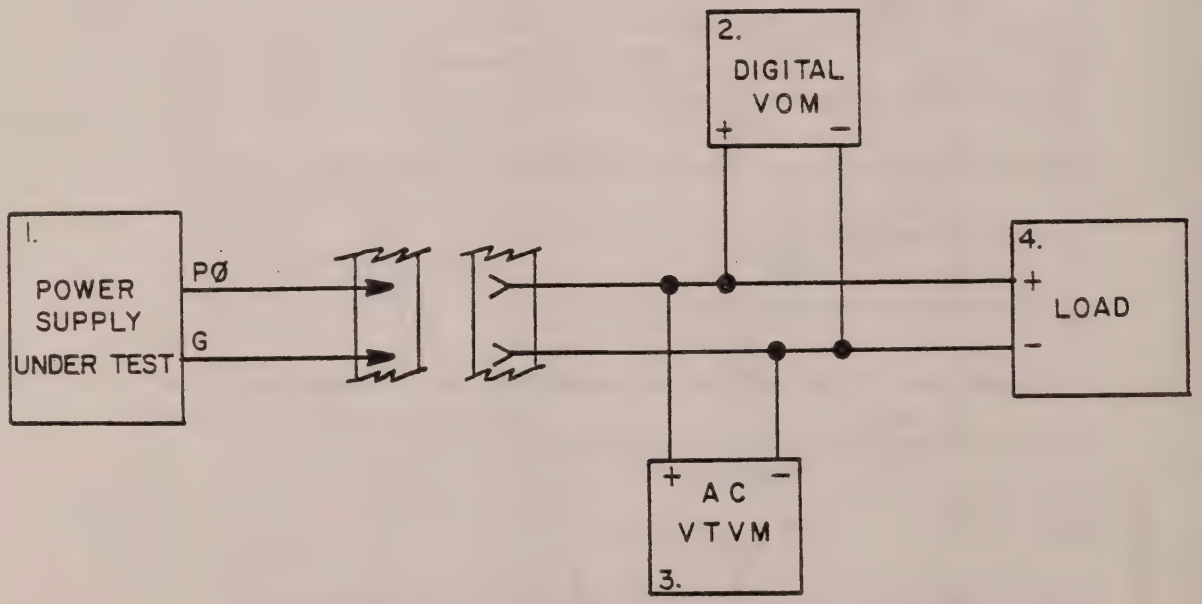
TEST PROCEDURE
MICRO COM BASE POWER SUPPLY

I. Test Set-Up

A. Test Equipment

1. Micro Com Base Power Supply
2. Digital VOM
3. AC VTVM
4. Power Load (See Section III)

B. Test Interconnection Diagram



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE	APPROVALS	DATE	Regency® COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937
FRACT ± DEC .XX± .XXX± ANG. ±	DRAWN SJR	5-80	
	CHECKED		
	DFTG. SUPV.		
MATERIAL	ENGR. HDT	6/80	TEST PROCEDURE - MICRO COM BASE POWER SUPPLY
FINISH			SIZE A | PART NUMBER TP-14-297 | REV B
DO NOT SCALE DRWG.			SCALE | SHEET 1 OF 3

II. Set-Up Instructions

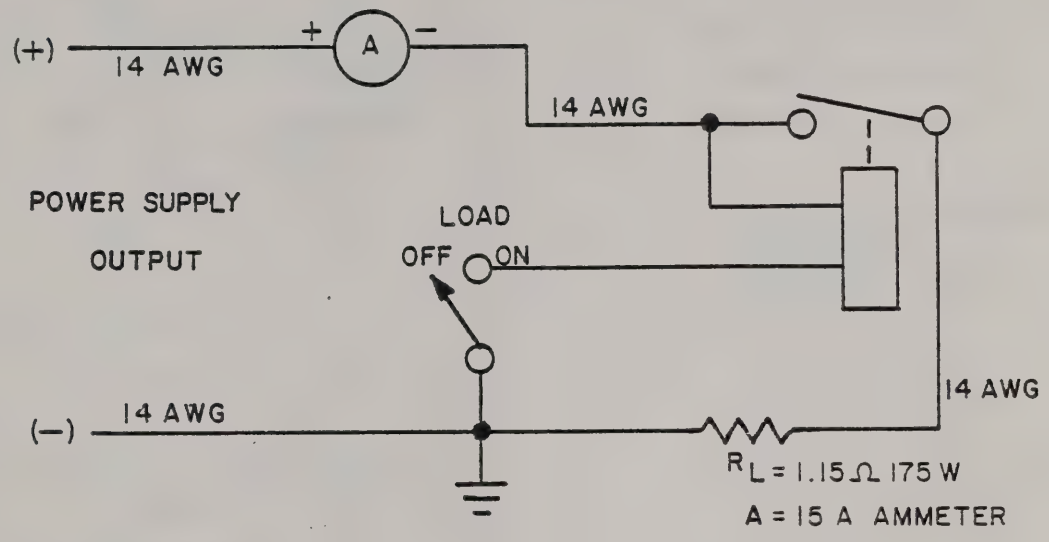
A. Connect the digital voltmeter (2) to power supply output.

B. Connect the AC VTVM (3) to power supply output.

C. Connect a DC Load (4) to power supply output.

D. Plug in power supply to be tested into a 115V AC source.

III. Power Load



IV. Test Procedure

A. With the load (4) off, adjust the output to read 13.8V on the DVM (2).

B. Turn load on. The voltage read on the DVM (2), shall not drop more than 300mV. The ammeter will read 12A +.75A. The AC VTVM (3) will read less than 200 mvrms of ripple.

C. Turn off load.

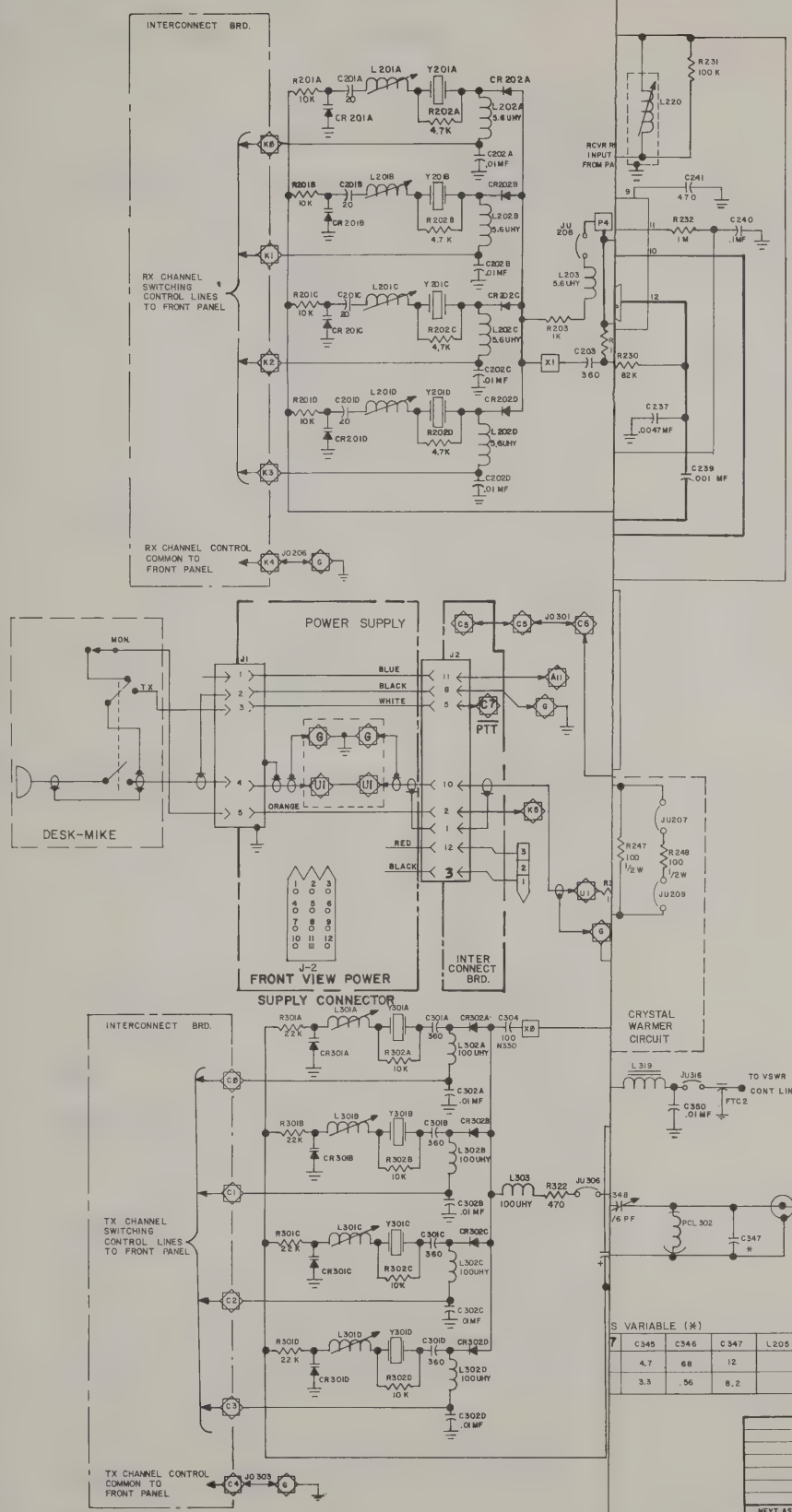
D. Adjust power supply for maximum output voltage. This voltage will be greater than 14.7V, but not more than 15.5V.

E. Adjust power supply for a minimum output voltage. This voltage will be below 12.2V, but not less than 11.8V.

V. Table of Performance Limits

PARAMETER	MIN	TYP	MAX
Load regulation	---	1.5%	2.2%
Ripple (full load)	---	150 mvrms	200 mvrms
Load Current (@ 13.8V)			
25% duty cycle	---	---	15A
100% duty cycle	---	---	12A
Output Voltage	11.8V	---	15.5V
Primary Voltage	105 VAC	115 VAC	125 VAC

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	RELEASE - R-325	5-21-80	HDT
	B	AB-190 6-17-80	6-17-80	HDT
	C	EN AB-287 DCD 9-80	9-80	HDT
	D	EN AB-312 SR 10-80	10-80	HDT



NOTES

1. ALL CAPACITOR VALUES NOT SPECIFIED OTHERWISE ARE PICO-FARAD.
2. ALL RESISTOR VALUES NOT SPECIFIED OTHERWISE ARE OHMS, ¼ WATT.
3. PARTS MARKED WITH (M) ARE VARIABLE WITH MODEL — (SEE PARTS VARIABLE CHART)
4. PART NUMBERS INDICATE LOCATION:
   - 0-99 CHASSIS MOUNTED PARTS.
   - 100-199 P.A. DECK BOARD
   - 200-299 RECEIVER SECTION (MAIN BOARD).
   - 300-399 TRANSMITTER SECTION (MAIN BOARD).
   - 400-499 CONTROL PANEL BOARD.
   - 1000-1099 INTERCONNECT BD.
   - 2100-2199 POWER SUPPLY ETC. BD.
5. ⬡ DENOTES PIN LOCATED ON P.C. BOARD.
   □ DENOTES CIRCUIT TIE POINT.
   ○JU○ DENOTES SOLDERED IN JUMPERS.
   ○JU● DENOTES HARDWIRE JUMPERS-USER SELECTED.
   ◄JO► DENOTES PLUGGED IN JUMPERS (OPTIONS).
   ———— DENOTES BOARD BOUNDARIES.
   ———— DENOTES OPTION VARIATIONS.
6. THIS SCHEMATIC IS USED IN CONJUNCTION WITH P.C. BOARD 704-064, PARTS PLACEMENT 704-062, ARTWORK 704-061
7. OPTIONAL JUMPER CONFIGURATION FOR +10.7 MHz L.O. INJECTION.
8. TRANSMITTER XTL HEATER ASSEMBLY CONSISTING OF 3 - 150 ohm 1/2W RESISTORS
9. RELATED SCHEMATICS ARE:
   - 604-164 - SCHEMATIC, POWER SUPPLY
   - 704-082 - SCHEMATIC, CONTROL BD.
   - 604-095 - SCHEMATIC, P.A. DECK
10. RT301 IS TO BE EPOXIED TO R334 ASSEMBLY.

REF. DESIGNATIONS	
LAST USED	NOT USED
C256	C236, C238, C253
C356	C319
R246	C323
R339	R227, R236, R239
Q207	
Q308	
IC203	
L227	L211, L217
L324	
IC302	
JO206	JO202
JO304	JO302
JU215	
JU319	
CR207	
CR302	
RT301	
RY301	

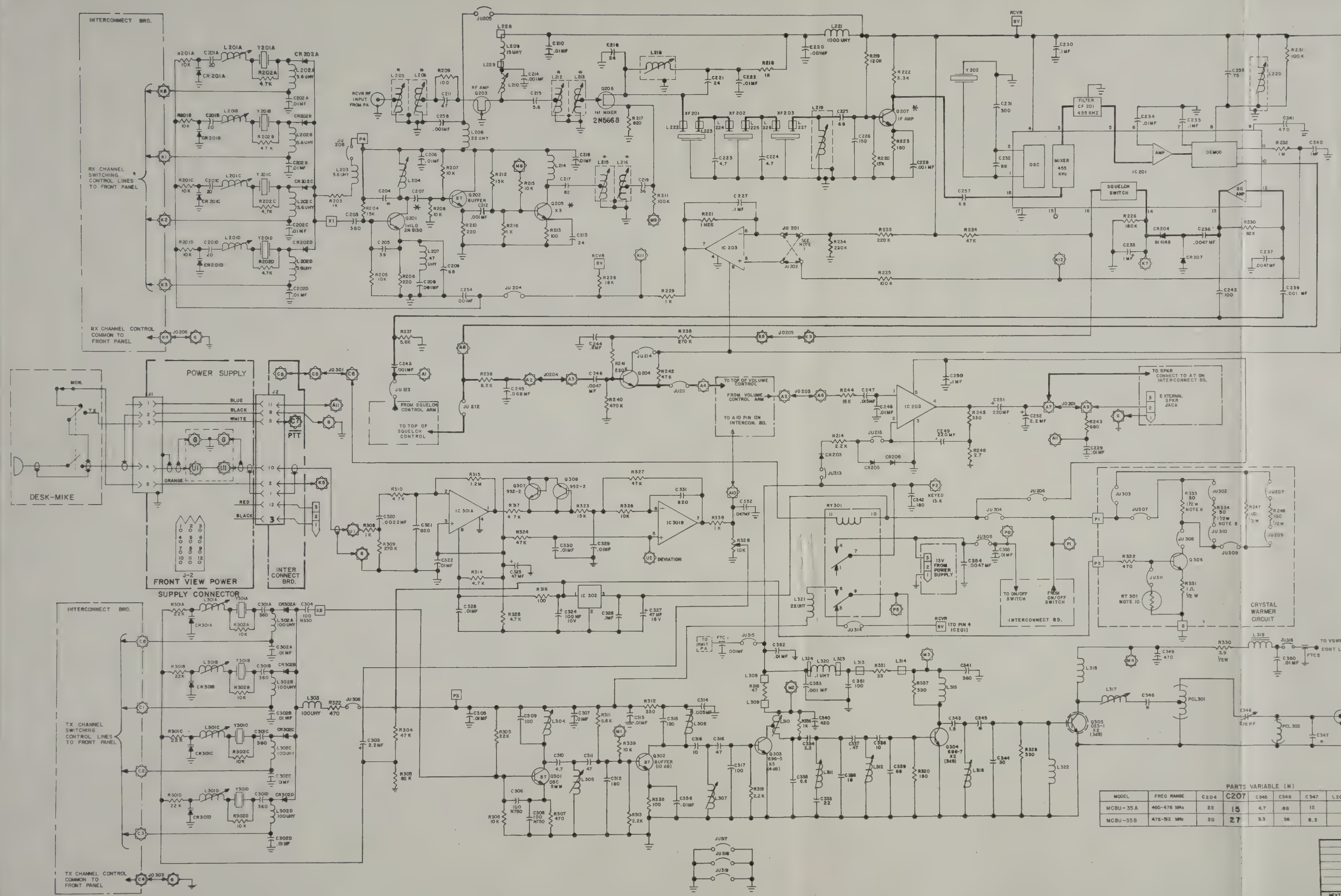
S VARIABLE (*)											
7	C345	C346	C347	L205	L206	L212	L213	L215	L216	Q205	Q207
	4.7	68	12							BLU TOP	BLU TOP
	3.3	.56	8.2							RED TOP	RED TOP

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT ± DEC ± .xx ± .xxx ± ANGLE ±	APPROVALS	DATE	COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937
			DRAWN S J R	12-79	
			CHECKED		SCHEMATIC MAIN BOARD
		MATERIAL	ENGR HDT	5-80	MCBU-38/19
	MCBU	FINISH			SIZE — PART NUMBER 704-090 REV D
NEXT ASSY	USED ON				SCALE — SHEET 1 OF
APPLICATION		DO NOT SCALE DWG.			

V. Table of Performance Limits

PARAMETER	MIN	TYP	MAX
Load regulation	---	1.5%	2.2%
Ripple (full load)	---	150 mvrms	200 mvrms
Load Current (@ 13.8V)			
25% duty cycle	---	---	15A
100% duty cycle	---	---	12A
Output Voltage	11.8V	---	15.5V
Primary Voltage	105 VAC	115 VAC	125 VAC

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	RELEASE - R-326	5-21-80	HDT
	B	AB-190 6-17-80	6-17-80	HDT
	C	EN AB-287 DCD 9-80	9-80	HDT
	D	EN AB-312 SR 10-80	10-1-80	HDT



NOTES

1. ALL CAPACITOR VALUES NOT SPECIFIED OTHERWISE ARE PICO-FARAD
2. ALL RESISTOR VALUES NOT SPECIFIED OTHERWISE ARE OHMS, ¼ WATT
3. PARTS MARKED WITH (*) ARE VARIABLE WITH MODEL — (SEE PARTS VARIABLE CHART)
4. PART NUMBERS INDICATE LOCATION
   - 0-99 CHASSIS MOUNTED PARTS
   - 100-199 P.A. DECK BOARD
   - 200-299 RECEIVER SECTION (MAIN BOARD)
   - 300-399 TRANSMITTER SECTION (MAIN BOARD)
   - 400-499 CONTROL PANEL BOARD.
   - ...99 INTERCONNECT BD.
   - 2100-2199 POWER SUPPLY ... BD
5. DENOTES PIN LOCATED ON P.C. BOARD
   - DENOTES CIRCUIT TIE POINT
   - JU DENOTES SOLDERED IN JUMPERS.
   - JU DENOTES HARDWIRE JUMPERS-USER SELECTED
   - JO DENOTES PLUGGED IN JUMPERS (OPTIONS)
   - DENOTES BOARD BOUNDARIES
   - DENOTES OPTION VARIATIONS.
6. THIS SCHEMATIC IS USED IN CONJUNCTION WITH P.C. BOARD 704-064, PARTS PLACEMENT 704-062, ARTWORK 704-061
7. OPTIONAL JUMPER CONFIGURATION FOR +10.7 MHz L.O. INJECTION.

TRANSMITTER XTL HEATER ASSEMBLY CONSISTING OF 3 - ... RESISTORS

RELATED SCHEMATICS ARE [illegible]

REF DESIGNATIONS

LAST USED	NOT USED
C258	C256, C238, C253
C356	C319
R248	C323
R339	R227, R236, R239
Q207	
Q308	
IC203	
L227	L211, L217
L324	
IC302	
JO206	JO202
JO304	JO302
JU215	
JU319	
CR207	
CR302	
RT301	
RY301	

PARTS VARIABLE (*)

MODEL	FREQ RANGE	C204	C207	C345	C346	C347	L205	L206	L212	L213	L215	L216	Q205	Q207
MCBU-35A	460-476 MHz	22	15	4.7	.68	12							BLU TOP	BLU TOP
MCBU-35B	476-512 MHz	20	27	3.3	.56	8.2							RED TOP	RED TOP

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE FRACT ± DEC .XX ± .XXX ± ANGLE ±	
MATERIAL	
FINISH	
APPROVALS	DATE
DRAWN S J R	12-79
CHECKED	
MFG SUPV	
ENGR HDT	5-80
NEXT ASSY	USED ON: MCBU
APPLICATION	DO NOT SCALE DWG.

Regency COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937

SCHEMATIC MAIN BOARD
MCBU-35/19

SIZE ~ PART NUMBER 704-090 REV D
SCALE — SHEET 1 OF 1

NOTE: All voltages are nominal and were measured with a VTVM at 13,6 VDC supply voltage.

VOLTAGE DATA - TRANSISTORS

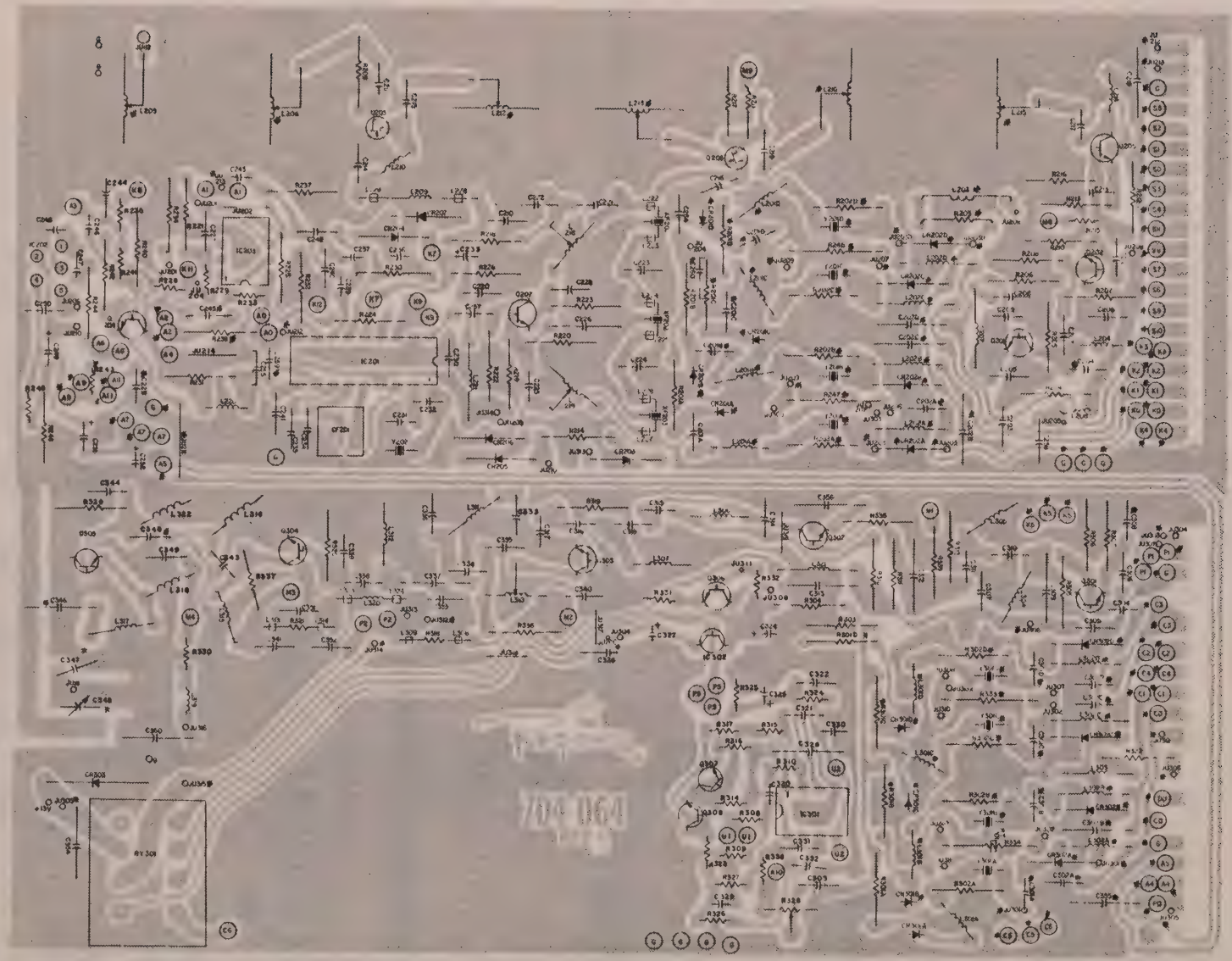
		CRYSTAL IN			CRYSTAL OUT		
RX MN. BD.	Trans.	Emitter (Source)	Base (Gate)	Coll. (Drain)	Emitter (Source)	Base (Gate)	Coll. (Drain)
	Q201	2.2V	2.7V	8.2V	2.2	2.9	8.2
	Q202	3.2	3.7	8.2	3.3	4.2	8.2
	Q203	1.2	0	7.8			
	Q205	0.7	0.54	8.2	0	0.6	8.2
	Q206	0.71	0	6.8	0.64	0	6.8
	Q207	0.2	0.85	5.2			
	Q204 sq.	2.4	3	8.2 Unsq.	0.9	0	8.2
TX MN. BD.	Q301	1.8	2.2	8	1.7	2.3	8.2
	Q302	1.4	1.8	3.1	1.4	2.2	3.6
	Q303	0	-1.5	10.5	0	0	13.6
	Q304	0	- .75	9.5	0	0	13.6
	Q305	0	0	11.5	0	0	13.6
	Q306	.2	.9	13.6 @25°C			
	Q307	4	3.9	3.9			
	Q308	3.9	4	4			

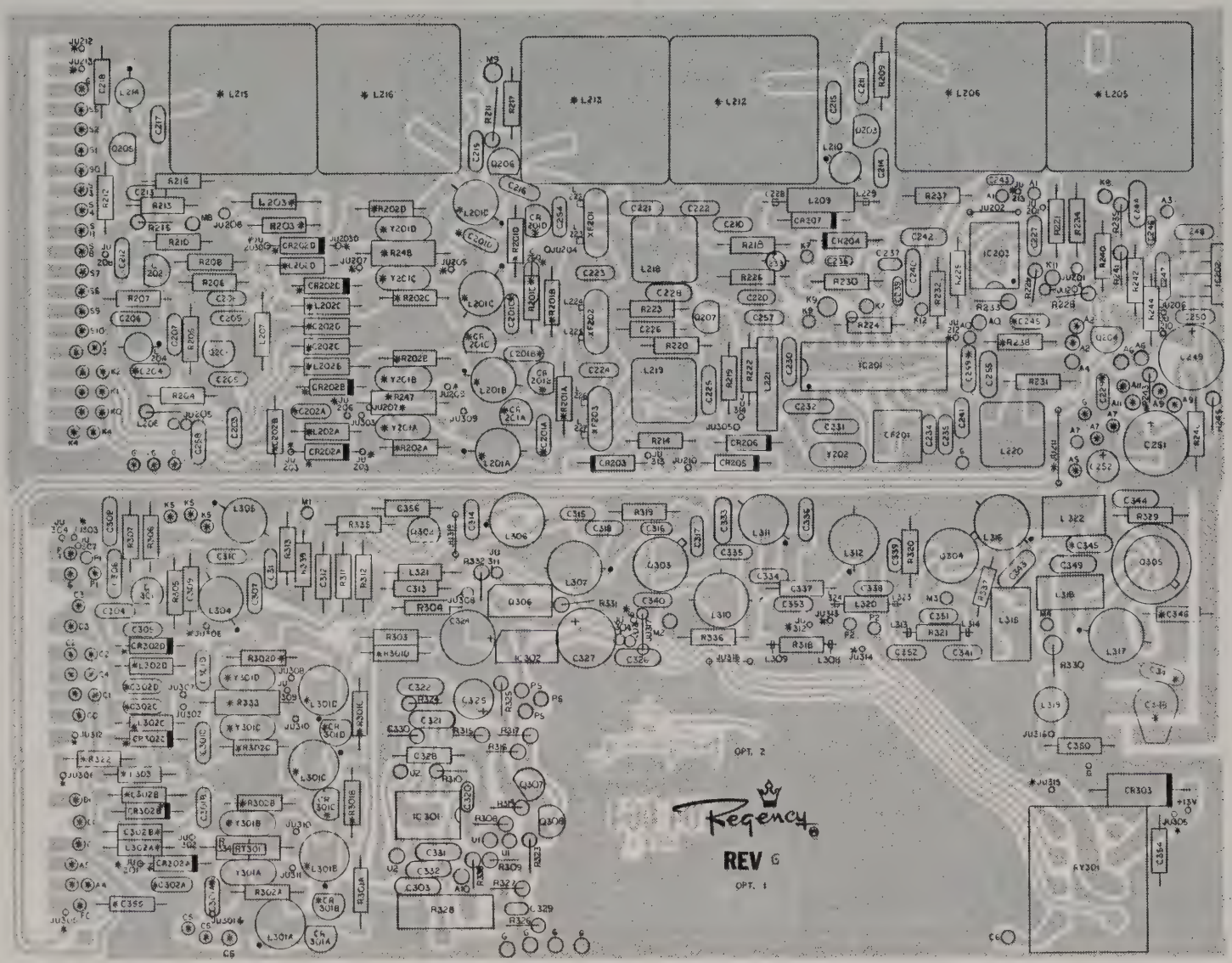
POWER AMP		KEYED 50 OHM MATCH			KEYED >4:1 VSWR MISMATCH		
	Q101	0	0.7	.2	0	0.6	12.0
	Q102	13.6	12.8	13.8	13.6	13.0	7.0
	Q103	0	0	13.6 VDC			
	Q104	0	0	13.6			
	Q105	0	0	13.6			

VOLTAGE DATE - INTEGRATED CIRCUITS

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IC201 Unsq.	8.0	7.6	7.7	8.2	1	1	1	8	4	3.4	4	2	2	0	7.6	7.5	5.0	2
Sq.														.6	0			
IC202	.7	.6	0	6.7	13.6													
IC203	7	5.5	5	0	4.0	4.0	2.8	8.2	@K11	3.2V								
IC301	3.8	3.8	3.8	0	3.8	3.8	3.8	8										
IC302	8.2	0	13.6															

	M1	M2	M3	M4
Tuned	1.5	10.2	9	12
Osc Off	2.1	13.6	13.6	13.6




Regency
REV G
OPT. 1
OPT. 2

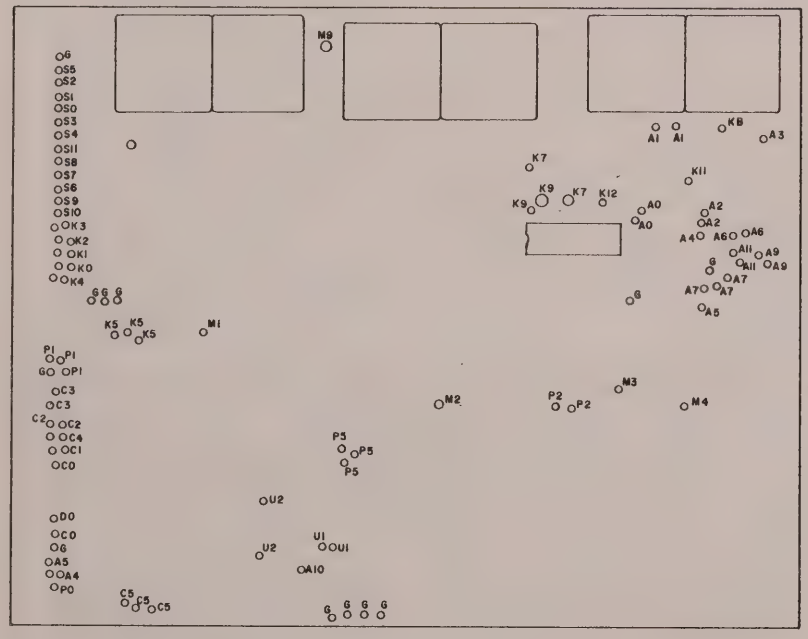


FIG. 4-5

DWG. NO. 304-211	SH 1	REV. A

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	RELEASE R-221	1-10-80	Daf

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT. ± DEC. .xx± .xxx± ANGLE ±	APPROVALS	DATE
			DRAWN CMcC	1-10-80
			CHECKED	
			DFTG. SUPV.	
		MATERIAL	ENGR. Daf	1-10-80
	MCU 30 II	FINISH		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DWG.		

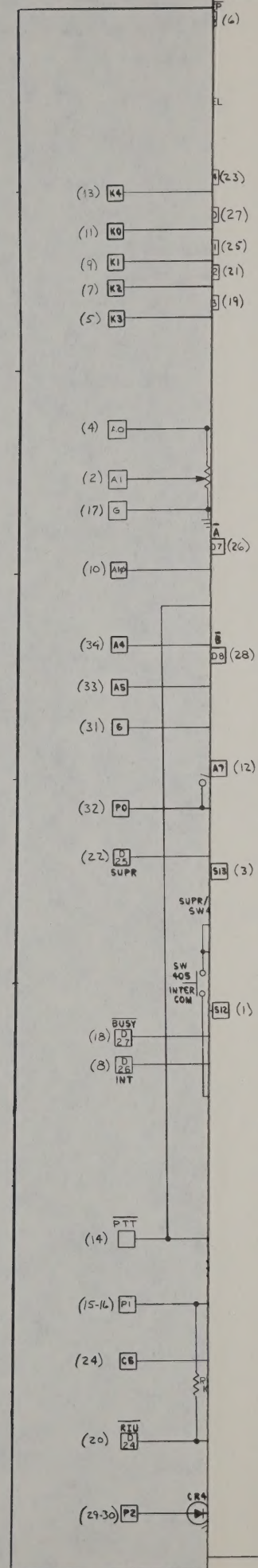
Regency COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

OPTION TIE POINTS
MAIN BOARD

SIZE	PART NUMBER	REV.
B	304-211	A

SCALE —— SHEET | OF |

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	R-238 SR 2-80	5/14/80	HDT
	B	EN AB-190 SR 6-80	6-17-80	HDT
	C	EN AB-287 DCO 9-80	9-18-80	HDT
	D	EN-AB-306 SR 9-26-80	9-26-80	HDT
	E	EN-AB-341 SR 10-80	11-14-80	HDT



NOTES:

1. UNLESS OTHERWISE SPECIFIED: ALL CAPACITOR VALUES ARE IN MICROFARAD. ALL RESISTOR VALUES ARE IN OHMS, 1/4W.
2. ○ DENOTES PIN LOCATED ON P.C. BOARD.
3. ○—○ DENOTES JUMPER – USER SELECTED. DICTATES THE MAXIMUM NUMBER OF CHANNELS THAT CAN BE SELECTED.
4. □ DENOTES TIE POINT TO CONNECTOR (P401).
5. ( ) INDICATES PIN NUMBER OF P401 (MATING CONNECTOR TO INTERCONNECT BOARD.)

REFERENCE DESIGNATIONS	
LAST USED	NOT USED
R451	R415
C421	
CR439	
Q411	
IC411	
SW405	

			APPROVALS	DATE
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT. DEC. ANGLE ± .XX ± .XXX	DRAWN MCNB	11-14-79
			CHECKED	
			QUAL. SUPV.	
	MCNB	MATERIAL	ENGR MDT	5/14/80
	MCLB			
	MCUB	FINISH		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DWG.		

Regency COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937

SCHEMATIC
CONTROL BOARD

SIZE E | PART NUMBER 704-082 | REV E

SCALE — | SHEET 1 of 1

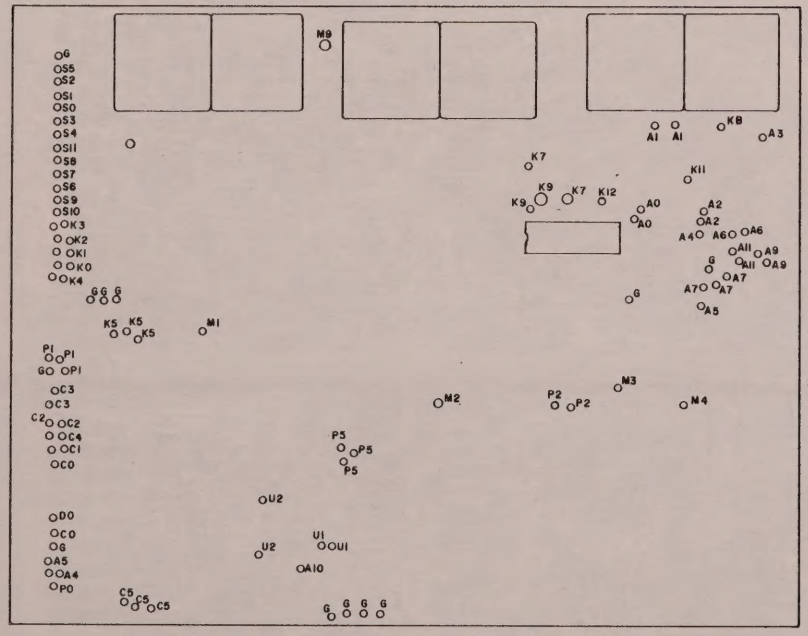


FIG. 4-5

DWG. NO. 304-211 SH 1 REV A

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	RELEASE R-221	1-10-80	DdJ

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT. ± DEC. .XX± .XXX± ANGLE ±	APPROVALS	DATE
			DRAWN CMcC	1-10-80
			CHECKED	
			DFTG. SUPV.	
		MATERIAL	ENGR. DdJ	1-10-80
	MCU 30 II	FINISH		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DWG.		

Regency® COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

OPTION TIE POINTS
MAIN BOARD

SIZE B | PART NUMBER 304-211 | REV. A

SCALE ——— | SHEET | OF

BISHOP GRAPHICS/ACCUPRESS REORDER NO. A-2306

ZONE	REV	REVISIONS DESCRIPTION	DATE	APPROVED
	A	R-238 SJR 2-80	5/14/80	MDT
	B	ENAB-190 SJR 6-80	6-17-80	MDT
	C	EN AB-287 DCD 9-80	9-18-80	MDT
	D	EN-AB-306 DCD 9-26-80	9-26-80	MDT
	E	EN-AB-341 SR 10-80	10-16-80	KDT

NOTES:

1. UNLESS OTHERWISE SPECIFIED: ALL CAPACITOR VALUES ARE IN MICROFARAD. ALL RESISTOR VALUES ARE IN OHMS, 1/4W.
2. ○ DENOTES PIN LOCATED ON P.C. BOARD.
3. ○—○ DENOTES JUMPER - USER SELECTED. DICTATES THE MAXIMUM NUMBER OF CHANNELS THAT CAN BE SELECTED.
4. □ DENOTES TIE POINT TO CONNECTOR (P401).
5. ( ) INDICATES PIN NUMBER OF P401 (MATING CONNECTOR TO INTERCONNECT BOARD.)

REFERENCE DESIGNATIONS	
LAST USED	NOT USED
R451	R415
C421	
CR439	
Q411	
IC411	
SW405	

			APPROVALS	DATE
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACT. DEC. ANGLES ± ±.01 ± ±.005 ±	DESIGN	
			DRAWN	
			CHECKED	
			ENGR. APPV.	
	MCHB		MFG APPV.	MDT 5/9/80
	MCLB	MATERIAL ——		
	MCWB	FINISH ——		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DWG.		

COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

SCHEMATIC
CONTROL BOARD

SIZE C | PART NUMBER 704-082 | REV E

SCALE —— | SHEET 1 OF 1